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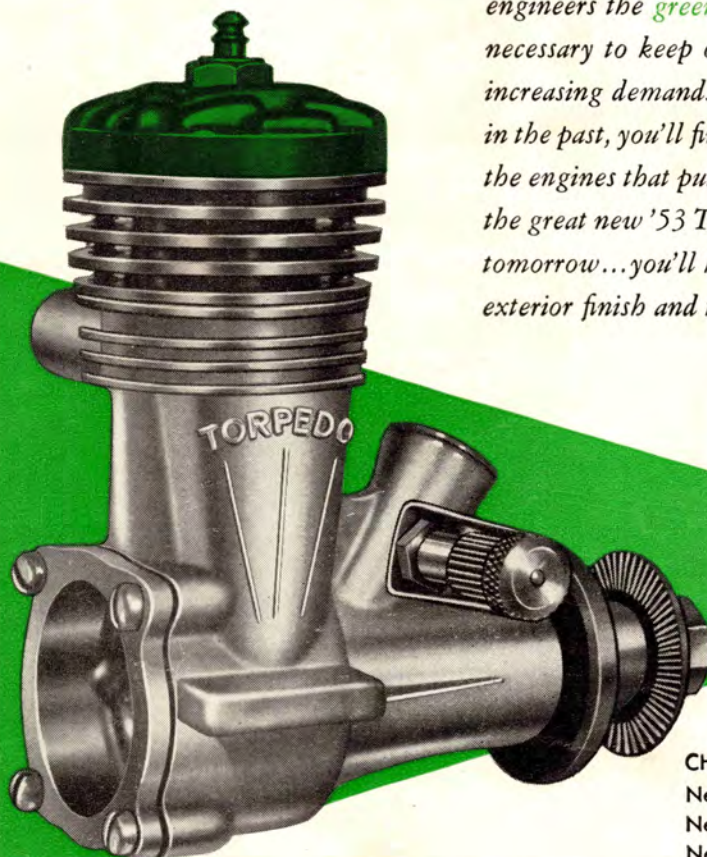
IN
THIS
ISSUE... **"DIID"** THE AIR
ATTACK
Game!

CAL SMITH

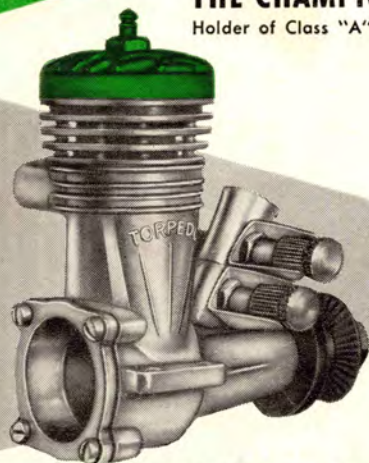
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FROM THE READER

Air Force Fledglings . . . Another airman, A/1c Bill Jensen, and I are in charge of the hobby shop here on the detachment. As we are beginners in the modeling game and this is a spare-time job we have been relying on Air Trails in many ways. Your ads are guides when we order supplies and your articles give many how-to-do-it-and-why hints to us and the other fledglings here.

A/1c Lewis French,
USAF, c/o P.M., San Francisco, Calif.

Balance . . . I like the new way of showing the planes in your magazine. It gets in more planes per issue than the other more detailed way. The May 1953 issue was a nice balance between cataloging the plans and presenting detailed construction notes on the planes shown.

Gerald Snyder,
Lehigh University, Bethlehem, Pa.

British Aircraft Firms. In answer to numerous requests for names and addresses of British aircraft manufacturing concerns, we are listing herewith the most important ones:

Sir W. G. Armstrong Whitworth Aircraft Ltd., Baginton Nr. Coventry. Auster Aircraft Ltd., Rearsby Aerodrome, Rearsby, Leicester. A. V. Roe Co. Ltd., Middleton, Manchester. Blackburn & General Aircraft Ltd., Brough, East Yorks. Boulton Paul Aircraft Ltd., Wolverhampton. The Bristol Aeroplane Co. Ltd., Filton, Bristol. De Havilland Aircraft Co. Ltd., Hatfield, Herts. The English Electric Co. Ltd., Queens House, Kingsway, London W.C.2. The Fairey Aviation Co. Ltd., Hayes, Middlesex. Gloster Aircraft Co. Ltd., Hucclecote, Gloucester. Handley Page Ltd., Cricklewood, London, N.W.2. Hawker Aircraft Ltd., Kingston-on-Thames, Surrey. Percival Aircraft Ltd., Luton Airport, Luton, Bedfordshire. Saunders-Roe Ltd., Osborne, East Cowes, Isle of Wight. Short Brothers & Harland Ltd., Queen's Island, Belfast, No. Ireland. Vickers-Armstrong Ltd. (Aircraft Sections), Vickers House, Broadway, Westminster S.W.1. (Includes Supermarine). Westland Aircraft Ltd., Yeovil, Somerset.

Annals . . . I have found your 1953 Annual very interesting and chuck full of helpful hints, and not having the 1952 Annual I've decided that I must have that too. I buy "A.T." every month and I'm not doing bad as a novice of six months. I consider your magazine my bible.

LaVon Willis, Bronx, N. Y.

• We thank you, LaVon. Readers may be interested in knowing that a limited number of 1952 "AT" Model Annals are still available from this office for 50c each, as are copies of Air Trails Model Annual for 1953.

Combine Reaps Praise . . . May I take this

opportunity to congratulate you on your plan number 1052, in which you combined an excellent scale model, the L-19, with a cool free fighter and a cute rubber job. That L-19 is a dream. Pat yourselves on the back for that plan.

Greg Weissenberger, Los Angeles, Calif.

Color of Jap Zeros . . . Could you tell me the regulation color of the Jap Zero?

Ian Binnie, Toronto, Can.

• The Japanese used different types of camouflage. Some planes were painted grey with irregular green patches on top and pale grey underneath, some were painted solid grey or green. Insignia was red disks on upper and lower surfaces of both wings and each side of fuselage outlined with a narrow white circle. A number of planes were not painted at all, retaining natural aluminum finish.

Seventh Air Force . . . I am in need of information on the Seventh Air Force very badly. I bother you with this only because the public library does not have anything on this subject. This is what I chose to write a term paper on in American History. The main things I want are the highlights on the action of this air force in its campaign in the South Pacific, and of course information on its activation and where it trained and was inactivated if it has been.

Tom Zumbro, Muskogee, Okla.

• For information on reference material concerning the Seventh Air Force, we suggest you contact the Air Force Association, 1424 K. Street, N.W., Washington 5, D.C.

British Movie . . . I saw "Breaking Through the Sound Barrier." They showed a World War II Spitfire which was put into a power dive. It was supposed to have reached the speed of sound as it began buffeting. Can a WWII Spitfire do Mach 1 in a power dive?

Richard S. Buck, Wilmington, N. C.

• As far as the Spitfire incident in the film is concerned, the airplane was dove until it reached its critical Mach number, otherwise a point at which it encountered compressibility; this does not necessarily mean that its speed was transonic.

A Wide-Awake Sleepless Knight . . . I am only 14 but I still think your magazine's wonderful. I'm building "The Happy Medium" and I think it's really going to be slick. I will try to send a picture. I am a member of the Montreal Sleepless Knights.

Richard Guess, Montreal, Quebec, Can.

All communications to the editors should be addressed to 304 East 45th St., New York 17, N. Y. **Subscription prices:** U. S. and Possessions—\$3.50 per year, \$6.00 for two years; Canada—\$4.00 per year, \$7.00 for two years; countries of the Pan American Union—\$7.00 per year, \$10.00 for two years; elsewhere—\$10.00 per year, \$14.00 for two years. Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th St., New York 17, N. Y.

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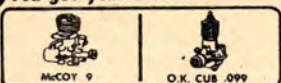
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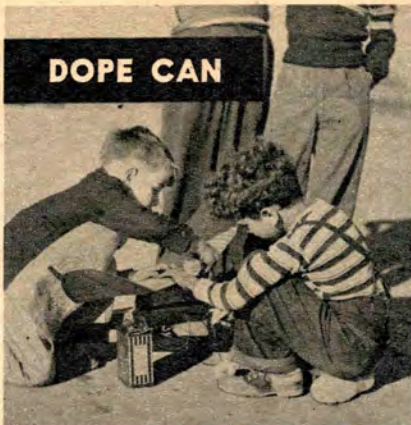
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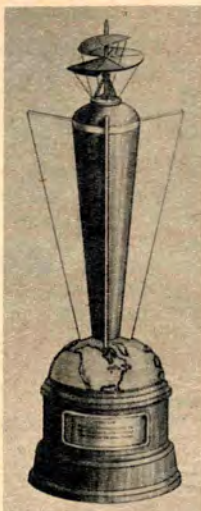
DOPE CAN



Two youthful free flight fans from the Tri-State area around Pittsburgh fire up their "mill" at Hillman's Model Wings Airport. Just goes to prove that you're never too young to get started.

Flying Model Copters Now on Nats Schedule

■ A completely new event for flying model helicopters in annual national competition will be sponsored by Hiller Helicopters. To be known as the "Hiller Model Helicopter Event," the contest will be incorporated for the first time in this summer's Nationals at Willow Grove, Pa., and will be a part of each Nats thereafter. If successful in the U. S., it is planned to broaden the event to be-



This unusual trophy is the Hiller award which will be presented to the winner of the National's 'copter competition at Willow Grove, Pa. The tiny model atop the perpetual trophy is fashioned after Da Vinci's drawings of what he visualized a helicopter would be — and the talented Italian wasn't far wrong even if he was centuries ahead of his time. You'll get more details on the new event from the Dope Can column.

come international in scope. Details:

Winner of the event will be awarded custody of the Hiller Trophy, a newly created perpetual 40-inch affair crowned with a model of the Da Vinci helicopter, forerunner of all rotary-wing designs. The trophy will be presented to the AMA which will award it each year.

The Academy has adopted rules which will permit judging of models able to rise and descend vertically, as well as fly horizontally after the fashion of full-scale machines. The regulations permit rubber, jet or internal combustion power and the victor will be chosen on a point system for flying characteristics.

To earn points under the system entries must demonstrate capabilities in vertical flight, forward flight and duration, then may perform special maneuvers for additional credit.

Besides a number of expert model builders at Hiller Helicopters, including president Stanley Hiller, Jr., leading model aviation authorities assisted in getting the event underway and in formulating rules. Among these were Russell W. "DID" Nichols, Executive Director of the AMA, Frank Zaic, editor of the Model Aeronautics Yearbooks, Carl "Cumulus" Goldberg, Roy Clough, well-known model designer and "AT" editor Al Lewis.

Original proposal for the event was made in 1951 after determining that interest in helicopter models was on the increase and that no true 'copter model class existed. The intervening time was spent in working out details. Hiller's sponsorship of the event was a natural result of the desire to assist model builders interested in rotary wing craft. At last year's Nationals at Los Alamitos NAS the company was instrumental in providing Navy HTE-2 helicopters to chase and retrieve airplane models. Participants were unanimous in



Ed "Toast of the Town" Sullivan admires the new Mercury like one to be awarded as grand prize in Ohlsson Mfg Co's \$5,000 slogan contest. You get dope and entry blanks at your hobby shop.

declaring that the helicopter was here to stay — especially as a means for locating and returning far-flying models!

There are no age limits on competition. The rules are as follows:

CLASS I — Rubber powered helicopters of any design configuration the gross weight of which is not to exceed 10 ounces. May use any rotor system, gears, clutches or co-axial cage drive. No limit on size, number of rotors or proportion of rubber to structure.

CLASS II — Jet powered helicopters using rotors driven by reaction or combusting or stored gases adhering to safety rules. Judges may decide if hazard exists with (Continued on page 10)



John B. Vella of Malta with his VB-X4 delta control line semi-scaler designed by himself and brother Wilfrid. Does 60 mph on 50 foot lines. The best elevator response is above 35 mph.

AIR TRAILS

15 Fifteen Famous Fighters 15

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F4U Corsair	2.75	F8F Bearcat	2.75	British Spitfire	2.75
		ME-109 Messerschmitt	2.75		

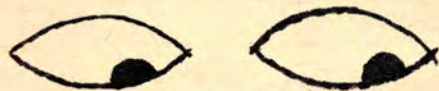
Ask your dealer for "Dyna-Mo." If he cannot supply you write us direct, enclosing check or money order plus 25¢ for packing and postage—no C. O. D.'s.

DYNA-MODEL PRODUCTS COMPANY

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Sponsored every week
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Mutual Broadcasting System

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(Continued from page 8)

untried methods of generating pressure and disqualify any likely to be dangerous. 20 ounces maximum weight.

CLASS III—Internal combustion engine powered helicopters, whether direct drive, torque reaction drive, ducted fan, pressure jet, torque converter or friction, pulleys, gears or other methods. Gross weight not to exceed 30 ounces and power plant no larger than .30 cubic inches total displacement.

Each model shall be allowed a total of three flights, during which two types of flying must be demonstrated: One to determine vertical flying ability, and one to determine forward flight ability. Duration flights may be concurrent with either vertical flight or forward at discretion of contestant. Up to three additional flights, not to be judged for duration, may be made to demonstrate other talents of the machine only after completing successful forward and vertical attempts.

To keep everything on an even keel, the event sponsors have set up these definitions: **Model Helicopter**—an aircraft which derives its sustaining lift from a rotating airscrew or airscrews operating in substantially a horizontal plane, capable of vertical take-off and descent and directional flight. Machines not capable of directional flight to be considered "stick helicopters" and not qualified to compete in this category. **Vertical Flight**—demonstrated ability to fly at an angle not less than 80 degrees, subject to wing drift (at the discretion of the judges). **Forward Flight**—progressive motion of the aircraft along its longitudinal dimension axis with positive gain in distance in a forward facing direction, when that motion shall be deemed to be definite progression and not merely a pitching oscillation. **Backward Flight**—any reasonable degrees of backward flight should be acceptable and an extra point maneuver. **Side-wise Flight**—progression of the aircraft in a lateral direction which does not result in tipping over and loss of lift. An extra point maneuver, not a requirement. **Autorotation**—a free spin descent of the craft in which the main rotor shall continue to rotate in the direction it does under power. Body of helicopter should not rotate excessively.

Vertical flight is to be judged as follows: retention of heading, 10 points; stability in flight, 20 points or proportion thereof; lack of self-induced drift, 10 points; good landing, 10 points. Stability and lack of oscillating tendencies should be emphasized. Maximum vertical flight points, 50.

Forward flight: any model which can demonstrate ability to progress horizontally in aggressive fashion shall be awarded up to 40 points. Any model which can describe a complete circular flight path, the diameter of which is at least 10 times its own length, may be awarded up to an additional 20 points. Total possible points, 60.

Duration: may be counted as part of any flight specified by contestant, points to be awarded as follows—0.5 points per second for rubber, 0.3 points per second for jet and 0.2 points per second for gas, except that no more than 30 points shall be awarded a gas engine-powered model 'copter provided that the engine(s) operate longer than 30 seconds. Ten minute maximum duration rule and out-of-sight regulations shall apply here, otherwise.

Special maneuvers: In addition to those prescribed, the entrant may perform any special maneuver or stunt of his own choosing for a maximum of 25 points depending upon adherence to his announced plan and worth of maneuver.

All models are to be equipped with suitable alighting and ground support gear and shall ROG for all official flights. It is desirable that all designs be of the semi-scale type or a projected model of proportions reasonably consistent with man-carrying machines. However, no payload or ballast is required, except as optional with the builder to secure a desired flight trim.

There's no restrictions on the number or disposal of rotors, except no metal rotors shall be used as main rotors or as torque

(Continued on page 12)

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IN THIS PICTURE....**

Just take the controls of an A-J Firebaby and you'll know what we're writing about. Feel the tug of the engine as your plane strains to leap into the air... feel it respond to every movement of your wrist as it streaks for altitude... know the thrill of a full power dive... and how easy it is to do stunts!

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for **FUN**
or **FAME...**

fly low-cost
rubber-powered planes
wound with



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(Continued from page 10)

correction or steering rotors. No entry may be equipped with a wing, other auxiliary supporting surface, or stabilizing surface which exceeds the area of one rotor blade.

However, there is no restriction on the method you may use to obtain various flight performances. Ballast, CG shift, cyclic control, or rotor imbalance may be used except when you carry ballast for forward flight. Then such ballast must be carried on all other flight tests. Gyrodynes or convertiplanes are eligible, but they must demonstrate true helicopter characteristics of vertical flight.

To make sure that everything is on the up-and-up, the following special safety requirements will be enforced in Class II: No combustng reaction motor and no pressure bottle, bulb or other reservoir, boiler or generator shall be affixed to any model or rotor system in such fashion as to permit it to escape due to centrifugal force or other reason. No reaction powered craft shall use spontaneously combustng liquid, solid or gaseous fuel. All flapping hinges, pivots, feathering hinges, gimbal connections must satisfy judges they will not fail in air. Full power run-up may be required by the judges.

Nats Entry Blank. If you haven't got yours in yet, you'd better hurry! You can get 'em from the Academy of Model Aeronautics, 1025 Connecticut Ave., N.W., Washington, D. C. Also—applications for the Paul K. Guillo Memorial Award will be mailed by AMA upon request. Be sure and nominate a deserving flyer from your vicinity for this important judging.

Win the Nats and Go to Japan! That's what West Coast model flyer and photographer Fudo Takagi predicts. He reports that the Model Airplane Federation of Japan was approached by our State Department through the American Embassy in Tokyo to conduct an International Modelplane Contest in Japan. One of Fud's friends in the MAFJ says the idea was given enthusiastic acceptance.

Though news may be a bit premature, the tentative (and—so far—unofficial) arrangements are as follows: 1) the contest will be held near Tokyo this fall, probably in October; 2) the American team would consist (under present planning) of about 30 members—ten each in Open, Senior and Junior age groups—to be selected at the American Nationals at Willow Grove. 3) Japanese eliminations to be held in August.

Along with the foregoing friend Takagi passes along results of a big 2-day contest in Japan which drew 504 entries despite poor weather conditions. The control line events were run off at the Tachikawa airbase and the free flight events were held at an unused airfield near Narashino.

Very respectable times were turned in. Top time in free flight was in Class A where Shinji Kuze racked up 14:41.2. Top towline glider scoring was Mitsuo Kishi (winner of last year's PAA "transocean" payload contest) whose "American Limited" class entry did 10:54.2. The same individual won the Nordic event with 10:16.4. Other free flight events produced comparable times.

Top speed marks were made in jet by a chap named Smith, probably one of the many U. S. GI entrants, with 150 mph; in Class C. Toranosuke Kondo racked up 127 mph. Top stunts points were 286.6 established in the Class B competition by a Mr. Nakajima.

Fly in the International Jetex. You can, you know. The 1953 Jetex Ratio-Duration Contest Finals, an international affair, will be held in conjunction with the All-Britain Model Aircraft Rally at Radlett Aerodrome in Hertfordshire, England, on August 23rd. They're really eager for overseas entries. If you can't make it in person, you can ship your model and it'll be flown by proxy. Entry blanks and all info can be obtained from Wilmot, Mansour & Co., Ltd., Salisbury Road, Totton, Southampton, England. Write on light paper, send inquiries via airmail.

For information regarding the transport of overseas models to England in the U.S.A. contact American Telasco Ltd., 166 Spring Road, Huntington, N. Y. and in Canada, Model Craft Hobbies Ltd., 66 Washington Street West, Toronto.

—THE DOPESTER

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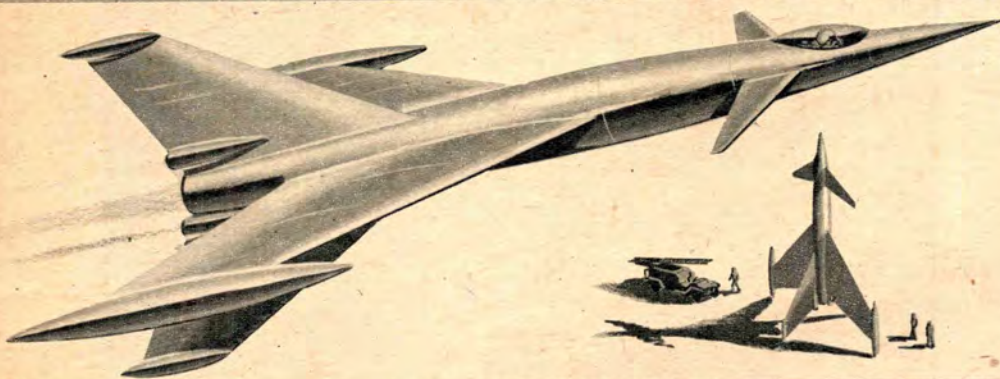
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1ST AWARD

Rocket and turbojet interceptor-fighter



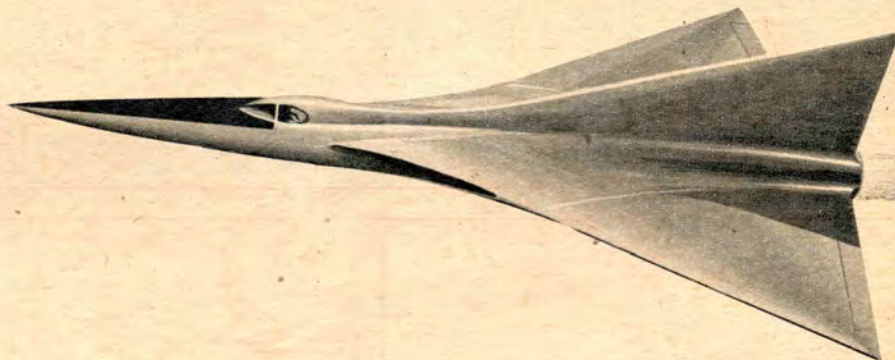
An interceptor-fighter by R. W. Flint of Los Angeles, Calif., capable of taking off and landing vertically. Powered by one 8000 lb. thrust turbojet in fuselage and two rockets of 8000 lb. thrust each. Pilot lies prone in pressurized cockpit. Vertical take-off, using all powerplants. Rockets are shut off as soon as sufficient altitude is gained and horizontal flight assumed. For landing, umbrella dive brake located between horizontal stab and wings is used together with split flaps in wings and rockets fired up to check rate of descent. Armament four 20 mm cannon.

2ND AWARD

Ramjet high-speed research plane

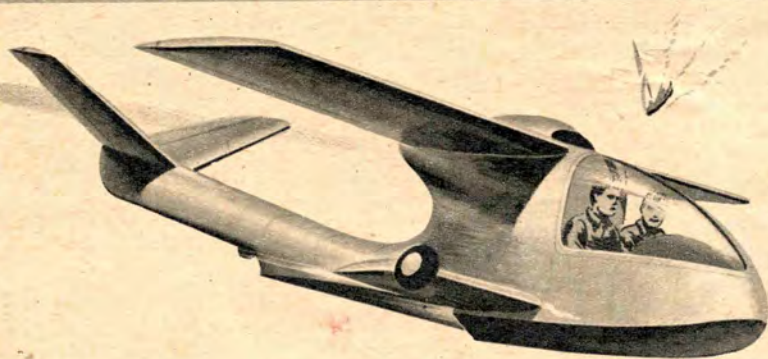


Delta wing research speed plane by David Morton of Kansas City, Mo. Can be powered by either ramjet or rocket engine. With former, the initial speed after take-off is attained by the use of jato inasmuch as ramjet does not develop any appreciable power until the speed reaches at least 300 mph. Speed with ramjet is estimated at 2000 mph, with rocket 3000 mph. Climbs to 65,000 ft. in 2 minutes. Plane carries 10 minutes of fuel. Bicycle l.g., wingtip wheel skids.



3RD AWARD

Two-place light jet-powered amphibian



A clever little two-place amphibian powered by an 880 lb. thrust jet engine, designed by Ain Sonin of Toronto, Canada. The "V" type tail surface can be lowered to assume horizontal position, thus preventing the ship from weathercocking when taxiing—a characteristic of seaplanes with large fin areas. When landing on land, both sponsons are lowered with wheels assuming vertical position. Note the moulded Plexiglas cockpit canopy which gives the little amphibian an excellent all-around vision. Span of this neat-looking, versatile craft is 42 ft.

AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

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Length 18 1/8 in. • Wingspan 24 1/2 in.

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Hopped up SPACE BUG

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You Ask / "AT" answers

Technical Dope on Midgets . . . In the article "Wing Ding in Detroit" there is mentioned a group of midget planes. Could you give me some source of technical information on the construction of a racing plane and the CAA regulations on their operation?

L. H. Wade, Sacramento, Calif.

• For complete technical information regarding the construction of midget racing planes, write to the National Aeronautic Association, 1025 Connecticut Ave., Washington 6, D. C.

What Is Stalling Speed? . . . Can you tell me what they mean by the "stalling speed" of an airplane? Could you also tell me how heavy the airplane losses for the U. S. and Germany were during WW II?

Chris Lorenzen, Little Neck, N. Y.

• Stalling speed is the speed at which the air flowing over the wing of the airplane becomes so turbulent that the wing does not lift any longer.

Germany lost 57,400 airplanes during World War II. The United States lost a total of 51,109 planes, both Army and Navy. This figure includes planes lost on both European and Pacific fronts.

Spitfire Mark II . . . You call the Spitfire a Mark II. I don't believe, and I have looked for it, that the British had a Mark II Spitfire. They had a Mark I, a Mark V, and Mark IX, but no Mark II. Am I correct?

David Ciocca, San Rafael, Calif.

• There definitely was a Spitfire Mark II airplane; as a matter of fact, there were some 30 different types of Spitfires built—last one being the Mark 24.

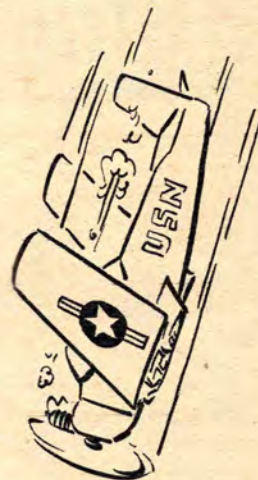
French or German? . . . In your January 1953 issue of Air Trails (page 24), it said that the Morane-Saulnier Bullet (France) was the first plane to have a machine gun that shot through the propeller. I disagree. Mr. Fokker invented the way of doing that, and he had it installed in a German plane.

John Morris, Dubois, Penna.

• You are correct in stating that Fokker was the first to use a synchronized machine gun; however, before that a machine gun was fired through the prop installed on a Morane-Saulnier and flown by the French ace Roland Garros. The back of the propeller was reinforced with a metal plate which acted as a deflector for the bullets that hit. Thus a number of bullets never reached their target as they ricocheted off the prop's back plate, but some did. It was crude, though somewhat effective; also costly, as it usually damaged the propeller.

Tiger Moth? . . . While glancing through your recent publication of Air Progress, I came upon an illustration of an aircraft that you have called a Tiger Moth. I have flown over 1000 hours in Tiger Moths and I can see no resemblance between the aircraft you call a Moth and the one I have. If I am wrong (which is doubtful) would you kindly explain my error? You will find the aircraft I speak of on page 53 in the magazine.

Dan Dolman, Vancouver, B. C., Can.



• We are afraid that the mistake is yours, not ours. There were two Tiger Moth types of airplane: the low-wing racing monoplane built in 1927 and called de Havilland 71 Tiger Moth which held the lightplane world speed record of 187 mph, and the biplane trainer Tiger Moth designated as de Havilland 82, which made its first flight in 1931.

Thunderbolt Firepower . . . Could the P-47 Thunderbolt fire all eight .50 cal. machine guns at one time?

Dennis Hamilton, Detroit, Mich.

• The P-47 Thunderbolt could fire all its eight .50 caliber machine guns at once.

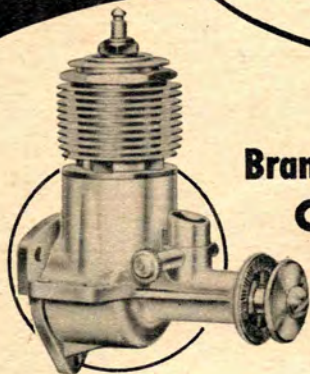
Addresses of Aircraft Manufacturers . . . Will you please send me the addresses of the following manufacturers of planes: Boeing, Curtiss, Douglas, Hiller, Grumman, McDonnell, North American, Kaman, Bell, Martin, Navy Air Dev. Center, Piasecki, Fairchild, Sikorsky, Chance Vought, Lockheed and Convair.

Bill Gooding, Oriental, N. C.

• Here are the addresses of the chief U.S. aircraft manufacturers, including those requested by you: Aerocar Co., Longview, Wash. Aero Design & Engineering Co., Bethany, Okla. Aeronca Manufacturing Corp., Middletown, Ohio. American Helicopter Co., Inc., 3613 Aviation Blvd., Manhattan Beach, Calif. Anderson, Greenwood & Co., Municipal Airport, Houston, Texas. Beech Aircraft Corp., Wichita 1, Kans. Bell Aircraft Corp., Buffalo, N. Y. Bellanca Aircraft Corp., Newcastle, Del. Boeing Airplane Co., Seattle 14, Wash. Cessna Aircraft Co., Wichita, Kans. Chance Vought Aircraft Division, United Aircraft Corp., Dallas, Texas. Chase Aircraft Co., Inc., West Trenton, N. J. Consolidated Vultee Aircraft Corp., San Diego, Calif. Curtiss-Wright Corp., Main & Passaic Sts., Wood-Ridge, N. J. Doman Helicopters, Inc., Municipal Airport, Danbury, Conn. Douglas Aircraft Co., Santa Monica, Calif. Fairchild Engine & Airplane Co., Hagerstown, Md. Fletcher Aviation Corp., Pasadena, Calif. Grumman Aircraft Engineering Corp., Bethpage, L. I., N. Y. Gyrodyne Co. of America, St. James, L. I., N. Y. Hiller Helicopters, Inc., 1350 Willow Rd., Palo Alto, Calif. Kaman Aircraft Corp., Bradley Field, Windsor Locks, Conn. Lockheed Aircraft Corp., Burbank, Calif. Glenn L. Martin Co., Baltimore, Md. McCulloch Motors Corp., 9775 Airport Blvd., Los Angeles, Calif. McDonnell Aircraft Corp., St. Louis 3, Mo. Meyers Aircraft Co., Tecumseh, Mich. Mooney Aircraft, Inc., (formerly in Kansas), Kerville, Tex. Navy Air Development Center, Mustin Field, Philadelphia N.A.S., Pa. North American Aviation, Inc., Los Angeles International Airport, Los Angeles, Calif. Northrop Aircraft, Inc., Hawthorne, Cal. Piasecki Helicopter Corp., Morton, Pa. Piper Aircraft Corp., Lock Haven, Pa. Republic Aviation Corp., Farmingdale, L. I., N. Y. Ryan Aeronautical Co., San Diego, Calif. Schweizer Aircraft Corp., Elmira, N. Y. Seibel Helicopter Co., Wichita, Kans. Sikorsky Aircraft Division, United Aircraft Corp., Bridgeport, Conn. Taylorcraft Inc., Conway, Pa. Temco Aircraft Corp., Dallas 2, Texas.

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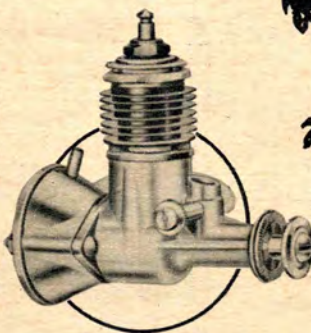
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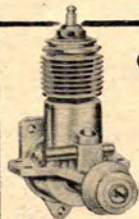
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ADVENTURE!

"It's Dashing Alberto, the Brilliant Brazilian!"

By his aerial feats Santos-Dumont
earned the title of "Father of Flight"

■ The manager of a big hotel in Paris walking upstairs one morning was astonished to see, running down from somewhere on a top floor, the figure of a tiny, disheveled little man with grimy hands and an extremely dirty face. This looked like a burglar! The manager sounded an alarm which brought waiters and hotel-porters hurrying to his assistance.

The little man was seized. Despite his protests, a call was about to be sent through to the police when one of the hotel staff cried out suddenly that a terrible mistake was being made.

"This is no thief!" he said. "I recognize him in spite of his condition. It is Monsieur Santos-Dumont! None other than the great Santos-Dumont himself. The flying man all Paris is talking about!"

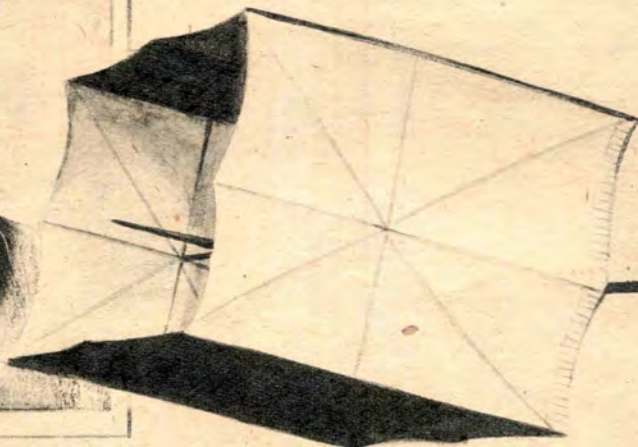
And so in fact it was. Little Alberto Santos-Dumont—the most amazing man aviation has ever known—had been flying over Paris in one of his baby airships when something had suddenly gone wrong. His miniature one-man dirigible had become uncontrollable, right over the heart of the city, and had crashed on the roof of the hotel.

Once his identity established, there was no question of calling in the police. On the contrary, the manager apologized profusely for his mistake. And justly so! For was not Alberto Santos-Dumont the most colorful figure our air world has ever known?

One of the most astonishing things about little Alberto was that, five years before the first airplane flew, he was designing, building, and himself flying tiny little 3½-hp airships which he handled with skill and precision. And in his construction of these baby dirigibles he was the

By HARRY HARPER

—GEORGE EVANS—



first man in the world to apply the gasoline engine in a practical form to the navigation of the air.

Back in 1901, in one of his little airships, he was the first aviator to win a prize for an out-and-return flight.

M. Henry Deutsch de la Meurthe, a well-known member of the French Aero Club, put up a prize of 125,000 francs. To win it an aeronaut had to ascend in his machine from the French Aero Club grounds at St. Cloud on the outskirts of Paris, fly in over the city, circle round the Eiffel Tower, and return again to his starting point, the entire flight to be made without alighting and in not more than one half hour.

An excitable little man, Santos-Dumont used to talk volubly and wave his arms when he was telling you any story. Here's the account he gave me of that history-making Eiffel Tower flight.

"You must understand," he told me, "that it wasn't at all a good day for my attempt. There was far too much wind for a small, slow-flying little machine like mine. But there had been

delays already, and as Aero Club officials were already out at St. Cloud I made up my mind that it was now or never.

"The wind was blowing behind me as I headed in over Paris, which was of course just as well. But when every now and then gusts came sweeping up behind me, I found my little machine rearing up like a startled horse, or suddenly putting its nose down in a dive which was not only as much as I could do to check, but which made me lose more height than I liked, being as I now was just above the streets and roofs of Paris. Another thing that worried me was that the wind was beginning to drift me away from the Eiffel Tower—which I could now see not far off.

"But my motor kept running well, and I managed to make headway. On nearing the top of the Tower I had to be careful to prevent any sudden gust carrying me too close. But luck was with me. Just at the critical moment there was a lull in the wind, and I managed to steer round the Tower at a safe height and distance.

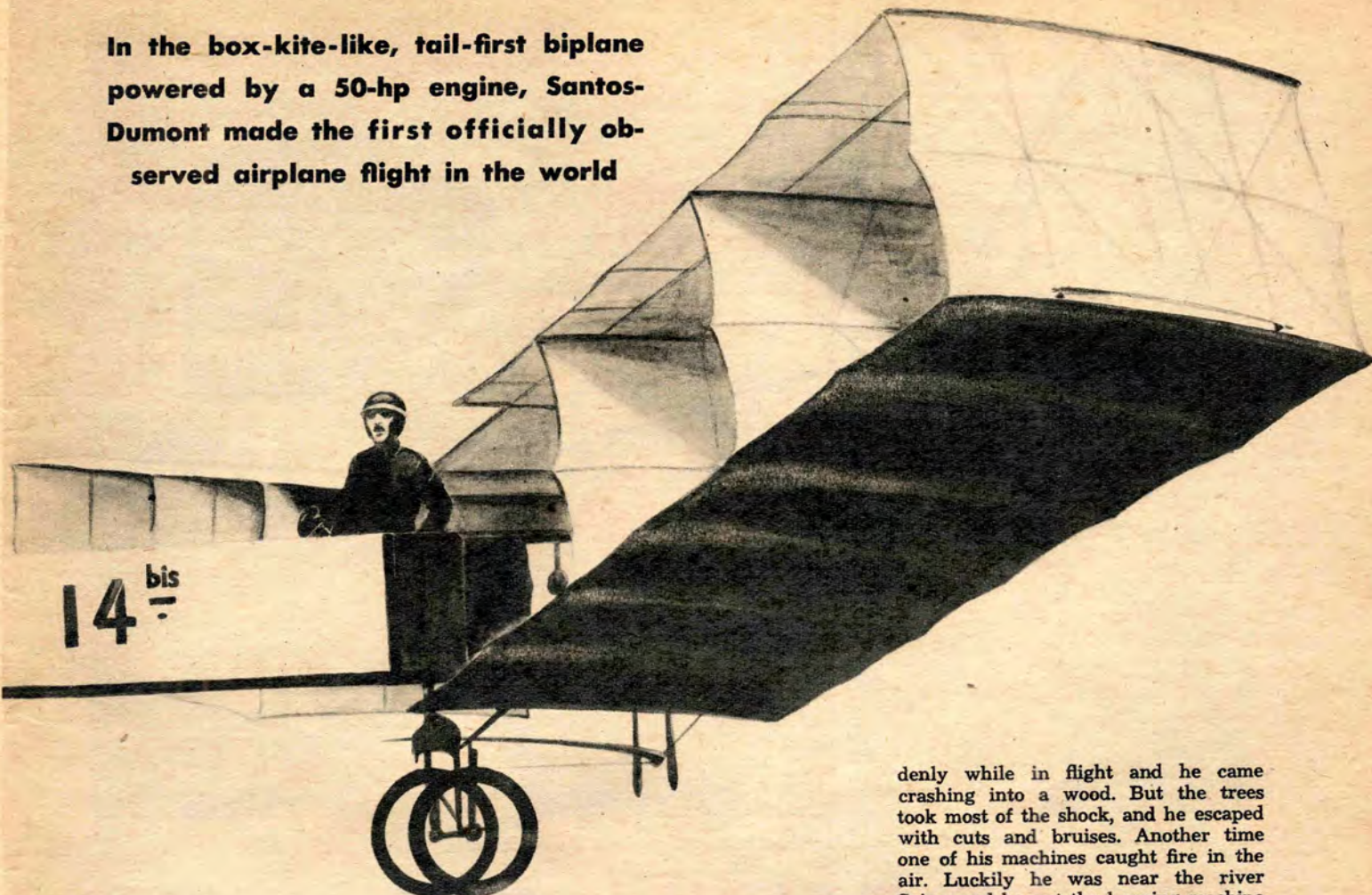
"So far so good. But it was now, my friend, that my real trials began. The wind was against me as I swung round to return to St. Cloud. Not only this, but I was dismayed to hear my motor spluttering and misfiring. I had not much doubt about what the trouble was. It was that carburetor of mine again.

"With a failing motor I knew I could make practically no headway. So there was only one thing for it. This was to leave the little basket-car from which I controlled my airship, and to climb along the open framework, or keel, to where the motor was located. None too pleasant, I assure you, what with the wind and the way my machine dipped and plunged.

"They told me afterwards that people below were holding their breath as they saw me working my way back towards that engine—more especially as with nobody at the controls the airship put its nose right up in the air, and it looked as though I might be thrown off the keel altogether.

"I knew just what to do when I did get to that engine, and soon I had it

In the box-kite-like, tail-first biplane powered by a 50-hp engine, Santos-Dumont made the first officially observed airplane flight in the world



firing evenly again. After which I managed to scramble back to my controls, and headed again for St. Cloud at the best speed I could muster. Fortunately there was another lull in the wind, and I crossed the finishing line with just half-a-minute to spare!"

Santos-Dumont was the first man in the world to organize anything like an aircraft factory with a regular staff of mechanics working in it. This he set up in the Rue du Colisee in Paris. It was here that skilled, specially picked men, working under his direction, produced the series of tiny airships on which he spent more than \$125,000. Not that the cost mattered much to him. The son of an extremely wealthy Brazilian coffee-planter, Alberto always had plenty of money for the air experiments which were his main hobby.

"The thing I wanted to prove," I remember him telling me, "was that small handy little airships like mine could be used as 'aerial runabouts' just in the same way as I drove about Paris in that little electrically driven motor-car of mine which used to attract such a lot of attention."

Although he was a man of many words, little Alberto was also a man of many deeds—and of some amazing ones, too. He said that the feat which had pleased him most was in connection with an appointment he kept for

luncheon one fine day in Paris.

It seems that he had agreed to meet some friends at a well-known restaurant near the Bois de Boulogne, the time for the lunch they were to enjoy being fixed for 12:30. There was a big lawn just outside the entrance to this restaurant, while at the end of the lawn lay a clump of trees.

The party had assembled in the restaurant at the time agreed and, as Alberto appeared to be a little late, they were looking out of the windows, expecting to see him driving up in his little electric motor-car. Instead, there came a humming noise from up in the air, and suddenly, popping just over that clump of trees at the end of the lawn, came one of Alberto's little airships, with himself at the controls. Neatly he maneuvered till it was hovering just outside the main doors of that restaurant. And then at the critical moment some of his mechanics, who had been hiding among the trees, ran over and steadied the car of the airship so that he could just step out of it and walk into the restaurant to keep his appointment. And after lunch he strolled back to his machine and flew off in it to pay an aerial call on some other friends in a chateau not far from Paris.

Amazing escapes Santos-Dumont had in some of his aerial adventures. One of his little airships buckled up sud-

denly while in flight and he came crashing into a wood. But the trees took most of the shock, and he escaped with cuts and bruises. Another time one of his machines caught fire in the air. Luckily he was near the river Seine, and he put the burning machine down into the water, and swam to a boat which was coming to rescue him.

When in due course he turned his attention from the problems of the airship to those of the airplane, he joined forces with the famous Voisin brothers. They built a box-kite man-carrying glider which was mounted on floats for towing by a fast motorboat on the Seine. Of course Santos-Dumont insisted on being at the controls of this glider on its first test. After skimming across the water it began to rise into the air. But then the controls refused to function properly, and it dived into the river, plunging beneath the surface with little Alberto still in it. However, as Parisians used to say, with a shrug of their shoulders, "You just can't kill this little man." And so he managed to disentangle himself from the sunken wreckage, and was soon climbing aboard the motorboat which had come to pick him up.

As a development of that ill-fated man-carrying glider, a 50-hp motor was fitted to a larger machine with a wheeled chassis. And it was in this, in 1906, that Alberto made the first admittedly short yet officially observed airplane flight in Europe. And then as a further step he built his tiny little 30-horsepower "Demoiselle" monoplane—a machine so small that he could transport it on the back of a motor-car. That miniature "Demoiselle" made history by being the first real light plane.

Alberto was (Continued on page 62)



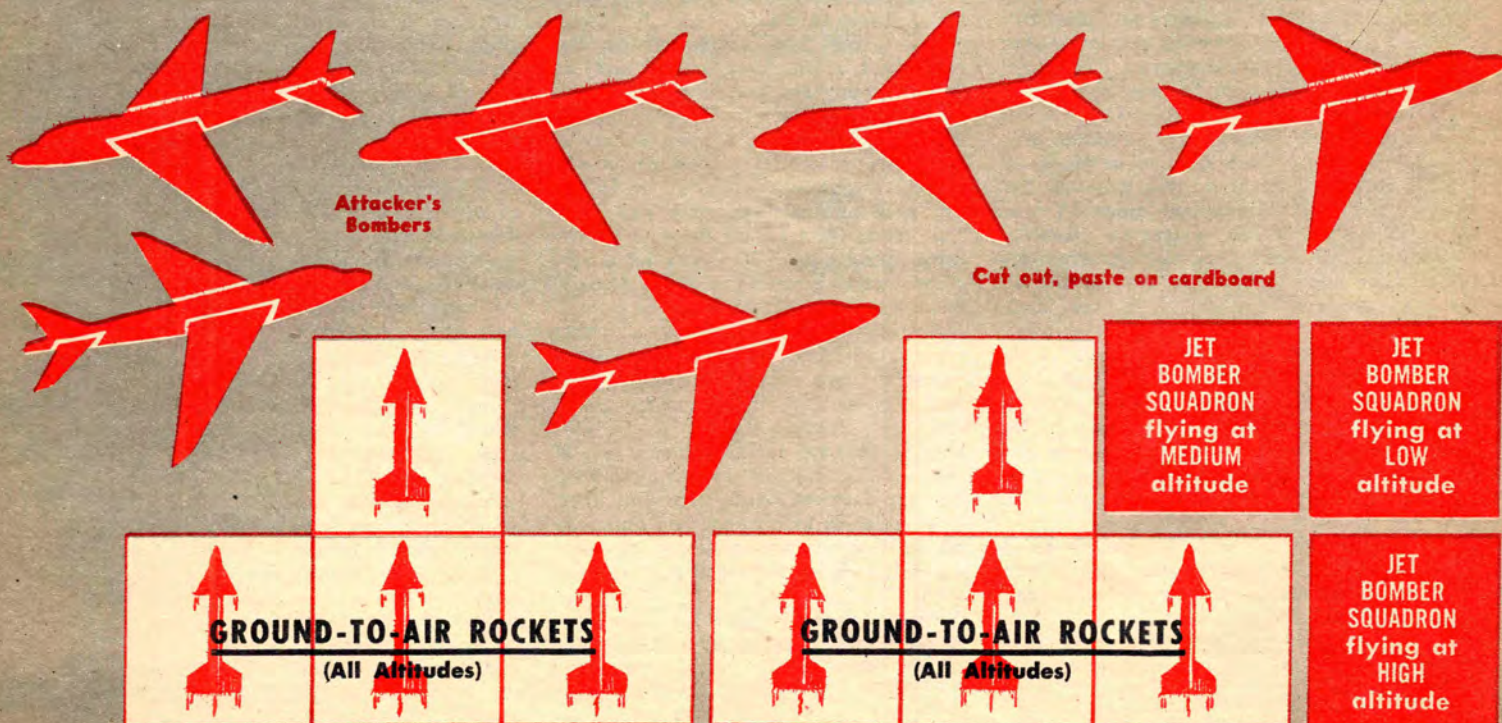
**It's Fun!
It's Educational!
It's Authentic!**

Play "DIID"

By RUSSELL W. NICHOLS

Vice President, Model Commission
Federation Aeronautique Internationale

(Detection—Identification—Interception—Destruction)



It's easy to construct your own "DIID" Game—learn to be a plane spotter

■ DIID is fun to play and easy to make. Just follow these simple directions: **FIRST** copy off on 3 x 5 inch filing cards the playing instructions found below and on page 25. Each square should be copied on one card so that when you finish you will have 36 different "direction" playing cards. You or your pals can duplicate the playing board easily because each square there is 1"; so just lay it out on cardboard (the inside of a suit box is good), then crayon or ink in the lines. Do a neat job with the lettering. Take your time. Cut out from the bottom of pages 22 and 24 the marker planes, the targets and the defense units. The big red planes are the Attacker's bombers. Cement each of the three flying to the left to a separate piece of filing card. Cut away each card to silhouette the bomber. Cement the end of a piece of medium-size music wire to the backs (blank side) of each of these red bomber silhouettes. Make one piece of wire 2½" long, another 3½" and the last 4½". When this is dry cement to the back of each "left-hand" bomber a bomber cut-out flying to the right which will match perfectly. Okay, so far? Good.

Now mount the Defender's All-Weather Fighters (the dark blue deltas) and his Standard Jet Fighters (the lighter blue swept wing jobs) in exactly the same manner on varying lengths of music wire.

Next step is finishing the mounting stands for the airplanes. Cut nine 1" squares from a sheet of 3/16" thick balsa wood. On each of these you cement one of the nine small 1" squares that read

"STANDARD JET fighters at HIGH (or MEDIUM, or LOW) altitude"; "ALL-WEATHER fighters at HIGH (or MEDIUM, or LOW) altitude"; and "JET BOMBER SQUADRON at HIGH (or MEDIUM, or LOW) altitude."

Your red bomber with the 4½" wire goes with the JET-BOMBER-SQUADRON-flying-at-HIGH-altitude "square." Push the wire through the middle of the square from the top, bend the bottom ½" of wire 90 degrees and cement the bent portion to the bottom of the balsa square. So now you have the Attacker's bomber squadron flying in high altitude position. The bomber on the 3½" wire goes through the JET BOMBER MEDIUM altitude square in exactly the same manner. Bend the bottom ½" of the wire and glue to the bottom of the balsa square. Similarly, the 2½" bomber wire is pushed through the JET BOMBER LOW altitude square, wire bent and cemented.

Follow this same procedure for the fighters. The 4½" long wire ALL-WEATHER delta fighter goes onto the ALL-WEATHER HIGH altitude base, the 3½" one matches up with the MEDIUM altitude base, and the 2½" one goes with the LOW altitude base. Similarly the STANDARD JET FIGHTER affixed to the 4½" wire is mounted on the HIGH altitude base, and so on for the other two SJF's.

Final task is to cut out the two Rocket units which belong to the Attacker, and the other units—Ground Observer Corps, Early Warning Radar, Anti-Aircraft, and

the 3 target cards—which belong to the Defender. Glue these to light cardboard for durability and cut them out. Now you're all set. Let's play "DIID"!

Rules for "DIID"

This is a game for two players. One player assumes the role of the Attacker, the other is the Defender. After one complete bombing attack the Attacker returns his Bomber Squadron to its base and points are totaled for each player; then their positions are reversed. After each player has completed a bombing run the victor is the one with greatest number of points.

How to Play: The Attacker sits at the NORTH end of the playing board and places his LOW Altitude Bomber Squadron marker on any of the take-off bases numbered 1 through 8. He may place his "Ground-to-Air Rocket" units over any of the squares on his side of the playing board as long as they do not overlap or extend over the center or back line or into the Off Course Area. It is permissible for these units to touch.

The Defender places his LOW Altitude All-Weather Fighter Squadron marker in the box provided at the left of his board and his LOW Altitude Standard Jet Fighter Squadron marker in the box provided at the right of his board. The Defender places his three targets marked Shipyard, Aircraft Factory, and Atomic Energy Plant—in any position anywhere he desires on his side of the board as long as they completely (Continued on page 71)

ATTACKER
Blue D: 1
Blue C: 1
Blue B: Course Change—IW
Blue A: 3
Red A: Navigation Error—IW
Red B: 1
Red C: Evasive Action—IE
Red D: 3
(Bombs Away: HIT!)

DEFENDER
EWR: Moves either Fighter Squadron 3 spaces
A-A: HIT! 5 points
GOC: Lack of volunteers, lose turn
AWF: HIT! 10 points
SJF: MISS

ATTACKER
Blue D: 1
Blue C: 2
Blue B: Navigation Error—IE
Blue A: Interceptors Sighted—IW
Red A: 2
Red B: Navigation Check—No Move
Red C: 2
Red D: 2
(Bombs Away: HIT!)

DEFENDER
EWR: I move for both Fighter Squadrons (altitude or space)
A-A: MISS!
GOC: Both Fighter Groups can make 1 altitude change
AWF: HIT! 5 points
SJF: MISS!

ATTACKER
Blue D: Orders Changed—No Move
Blue C: 1
Blue B: Navigational Error—IW
Blue A: 1
Red A: Faulty Radar—IE
Red B: 1
Red C: 1
Red D: 3
(Bombs Away: HIT!)

DEFENDER
EWR: Moves AWF 3 spaces
A-A: HIT! 5 points
GOC: Message Garbled—No Move
AWF: MISS!
SJF: HIT! 5 points

ATTACKER
Blue D: 1
Blue C: 1
Blue B: Navigational Error—IW
Blue A: Interceptors Sighted—IW
Red A: 1
Red B: Navigation Check—No Move
Red C: 2
Red D: 1
(Bombs Away: HIT!)

DEFENDER
EWR: Power Failure—Miss Turn
A-A: Faulty Ammunition—No Hits
GOC: Moves Standard Jet Fighters 4 spaces
AWF: HIT! 5 points
SJF: HIT! 5 points

ATTACKER
Blue D: Radio inoperative—No Move
Blue C: 1
Blue B: 1
Blue A: Navigation Check—No Move
Red A: Drifting—IW
Red B: 1
Red C: Interceptors Sighted—IE
Red D: 3
(Bombs Away: MISS!)

DEFENDER
EWR: Altitude change for both Fighter Squadrons
A-A: Some damage—3 points
GOC: Out to lunch—lose turn
AWF: Fuel Low—return to base
SJF: Lost bombers in clouds

ATTACKER
Blue D: Can't locate pilot—No Move
Blue C: 1
Blue B: 2
Blue A: To avoid aircraft—IE
Red A: 2
Red B: 2
Red C: 2
Red D: 3
(Bombs Away: HIT!)

DEFENDER
EWR: Moves AWF 4 spaces
A-A: HIT! 15 points
GOC: Moves SJF 2 spaces
AWF: Radar jammed—Miss turn
SJF: HIT! 5 points

ATTACKER
Blue D: 1
Blue C: Drifting—IE
Blue B: Navigation Error—IW
Blue A: 2
Red A: Avoid Aircraft—IE
Red B: 2
Red C: 2
Red D: 3
(Bombs Away: HIT!)

DEFENDER
EWR: Operator asleep at "scope"
A-A: MISS!
GOC: Moves either Fighter Squadron 3 spaces
AWF: MISS!
SJF: HIT! 5 points

ATTACKER
Blue D: 1
Blue C: 1
Blue B: Course Change—IE
Blue A: 1
Red A: 3
Red B: Anti-Aircraft Fire—IW
Red C: 2
Red D: 3
(Bombs Away: HIT!)

DEFENDER
EWR: Failed to identify Bombers
A-A: Didn't get "Flash"
GOC: Shift not manned
AWF: MISS!
SJF: MISS!

ATTACKER
Blue D: 1
Blue C: 1
Blue B: Headwinds—IW
Blue A: 2
Red A: 2
Red B: Unidentified Aircraft—IW
Red C: 2
Red D: 3
(Bombs Away: MISS!)

DEFENDER
EWR: Both Fighter Squadrons can make 1 or 2 altitude changes
A-A: HIT! 5 points
GOC: Faulty report—SJF return to base
AWF: MISS!
SJF: MISS!

ATTACKER
Blue D: 1
Blue C: 1
Blue B: Drifting—IE
Blue A: 2
Red A: 2
Red B: 2
Red C: Interceptors Sighted—IE
Red D: 3
(Bombs Away: HIT!)

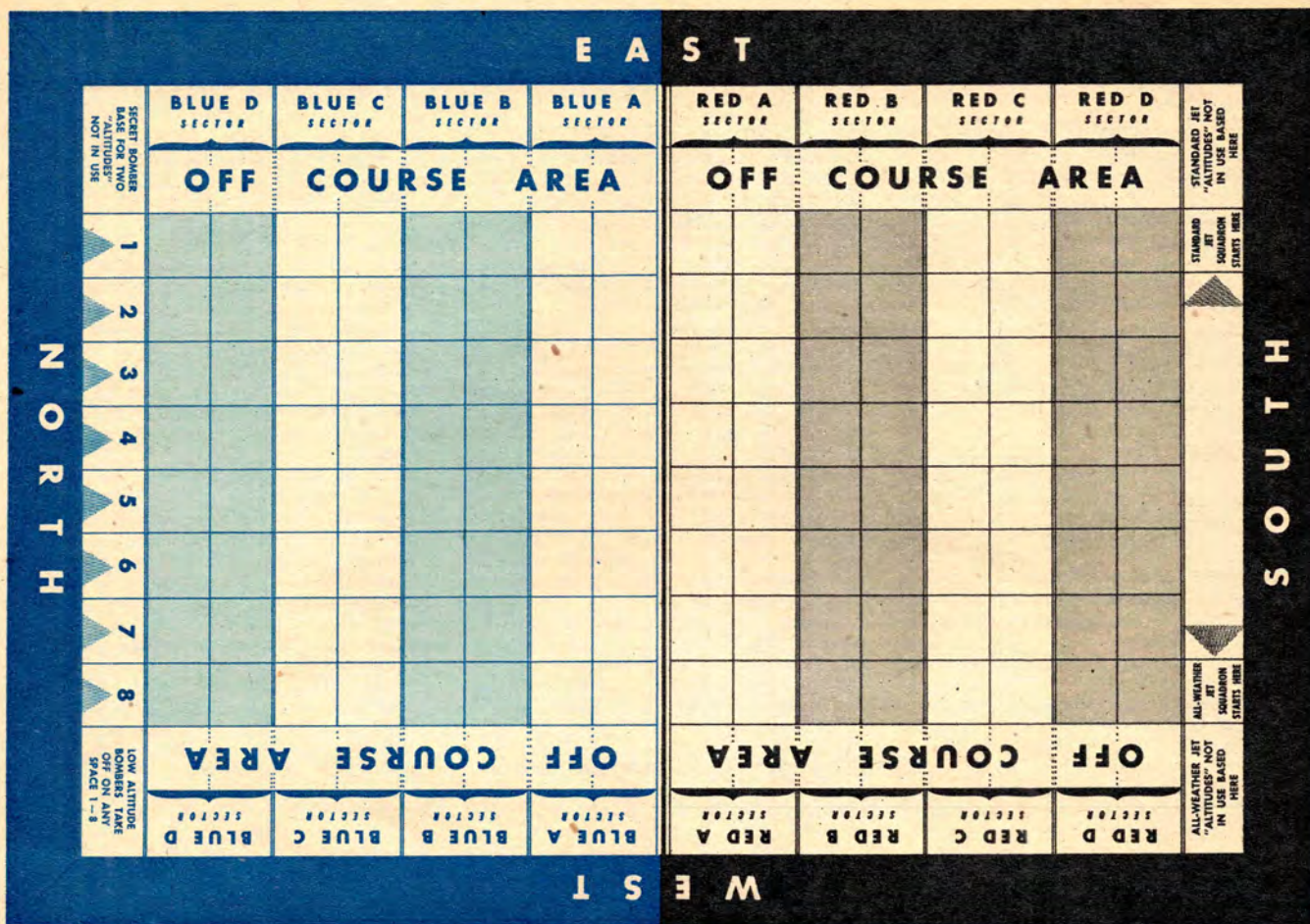
DEFENDER
EWR: Jammed—inoperative
A-A: Inoperative—sabotage
GOC: Watching birds—Miss turn
AWF: Out of fuel—return to base
SJF: Out of ammunition—return to base

ATTACKER
Blue D: 1
Blue C: Navigation Check—IE
Blue B: 1
Blue A: 2
Red A: 2
Red B: 2
Red C: Ground Fire—IW
Red D: 3
(Bombs Away: NEAR MISS!)

DEFENDER
EWR: Shift change, missed bombers
A-A: Everybody at the PX—Miss turn
GOC: Lack of volunteers, unmanned
AWF: HIT! 10 Points
SJF: HIT! 5 points

ATTACKER
Blue D: Change in orders—No Move
Blue C: Course correction—IW
Blue B: 1
Blue A: 2
Red A: 2
Red B: Avoid Aircraft—IE
Red C: 2
Red D: Gas low—jettison bombs—start home—4 spaces
(Bombs Away: HIT!)

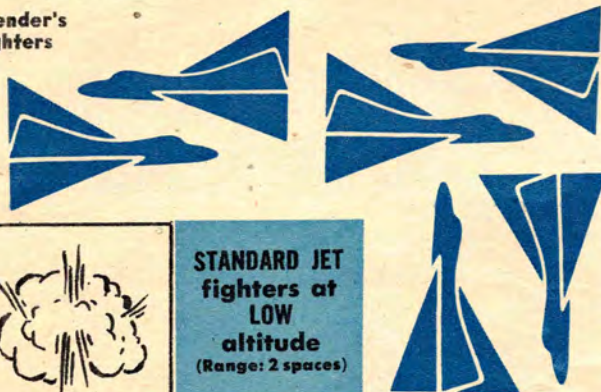
DEFENDER
EWR: Moves either Fighter Squadron 3 spaces
A-A: HIT! 5 points
GOC: Moves AWF 3 spaces
AWF: MISS!
SJF: Fuel low—Return to base



It's easy to duplicate the "DIID" Playing Board—the small squares are made exactly 1 inch, and all other spaces are of same relative size. Use cardboard for backing or draw directly upon it. Don't cut

out the fighter markers below or the marker base signs until you and your friends have copied off the direction playing card instructions on the bottom half of page 23. See instructions for mounting details.

Defender's
Fighters



See instructions before cutting out



ALL-WEATHER
fighters at
MEDIUM
altitude
(Range: 3 spaces)



STANDARD JET
fighters at
LOW
altitude
(Range: 2 spaces)



ANTI-AIRCRAFT UNIT
(Medium and High Altitudes)

STANDARD JET
fighters at
HIGH
altitude
(Range: 2 spaces)

SHIPYARD
Hit—100
Points
Near Miss
—35 Pts.

ALL-WEATHER
fighters at
HIGH
altitude
(Range: 3 spaces)

GROUND OBSERVERS CORPS
(Low and Medium Altitudes)

EARLY WARNING RADAR
(Medium and High Altitudes)

STANDARD JET
fighters at
MEDIUM
altitude
(Range: 2 spaces)



GROUND OBSERVERS CORPS
(Low and Medium Altitudes)

EARLY WARNING RADAR
(Medium and High Altitudes)

ATOMIC ENERGY PLANT
Hit—300 Points
Near Miss—100 Points

ALL-WEATHER
fighters at
LOW
altitude
(Range: 3 spaces)

AIRCRAFT FACTORY
Hit—200 Points
Near Miss—75 Points

GROUND OBSERVERS CORPS
(Low and Medium Altitudes)

ALL-WEATHER
fighters at
LOW
altitude
(Range: 3 spaces)

ATTACKER
 Blue D: Copilot missing—No Move
 Blue C: 1
 Blue B: 2
 Blue A: Navigation check—No Move
 Red A: Drifting—1W
 Red B: 2
 Red C: Interceptors Sighted—1E
 Red D: 2
 (Bombs Away: MISS!)

DEFENDER
 EWR: Generator trouble—No Move
 A-A: MISS!
 GOC: No volunteers, post unmanned
 AWF: Rockets not armed—MISS!
 SJF: Faulty ammunition—MISS!

ATTACKER
 Blue D: 3
 Blue C: 2
 Blue B: Course change—1E
 Blue A: 1
 Red A: 2
 Red B: Anti-aircraft fire—1W
 Red C: 2
 Red D: 3
 (Bombs Away: MISS!)

DEFENDER
 EWR: Moves either AWF or SJF 3 spaces
 A-A: HIT! 10 points
 GOC: Moves SJF 3 spaces
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: 1
 Blue A: 2
 Red A: 2
 Red B: 2
 Red C: 2
 Red D: 3
 (Bombs Away: HIT!)

DEFENDER
 EWR: Move each Fighter Squadron 1 space
 A-A: MISS!
 GOC: Move either Fighter Squadron 2 spaces
 AWF: HIT! 10 Points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: Avoid aircraft—1W
 Blue A: 2
 Red A: 2
 Red B: Ground fire—1W
 Red C: 2
 Red D: 2
 (Bombs Away: MISS!)

DEFENDER
 EWR: Inoperative, power failure
 A-A: MISS!
 GOC: Recruiting drive to begin tomorrow
 AWF: Radar out of operation
 SJF: Loses bombers in clouds

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: Course Change—1W
 Blue A: 1
 Red A: Ground Fire—1W
 Red B: 3
 Red C: Interceptors Sighted—1E
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: AWF and SJF can move 3 spaces
 A-A: HIT! 5 points
 GOC: Reporting error—AWF back to base
 AWF: MISS!
 SJF: MISS!

ATTACKER
 Blue D: 1
 Blue C: 2
 Blue B: Course Change—1E
 Blue A: 1
 Red A: 2
 Red B: 2
 Red C: Ground Fire—1W
 Red D: 3
 (Bombs Away: NEAR MISS!)

DEFENDER
 EWR: Moves one Fighter Squadron 4 spaces
 A-A: HIT! 15 points
 GOC: Permits 2 altitude changes for AWF and SJF
 AWF: HIT! 15 points
 SJF: HIT! 10 points

ATTACKER
 Blue D: 1
 Blue C: Course Check—1W
 Blue B: 1
 Blue A: 2
 Red A: 1
 Red B: 3
 Red C: Course Correction—1E
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: Moves either Fighter Squadron 1 space
 A-A: HIT! 5 points
 GOC: Moves AWF 3 spaces
 AWF: MISS!
 SJF: Fuel Low—Return to base

ATTACKER
 Blue D: 1
 Blue C: 2
 Blue B: 1
 Blue A: Navigation Check—1E
 Red A: 1
 Red B: 1
 Red C: 3
 Red D: Maps Lost—1W
 (Bombs Away: HIT!)

DEFENDER
 EWR: Inoperative, power failure
 A-A: MISS!
 GOC: Recruiting drive to begin tomorrow
 AWF: Radar out of operation
 SJF: Loses bombers in clouds

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: Check Position—1W
 Blue A: 1
 Red A: 4
 Red B: Fuel Leak—2E
 Red C: 1
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: Move each Fighter Squadron 1 space
 A-A: MISS!
 GOC: Move either Fighter Squadron 2 spaces
 AWF: HIT! 10 Points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 2
 Blue C: 1
 Blue B: 1
 Blue A: 3
 Red A: 1
 Red B: Navigation Check—1E
 Red C: 1
 Red D: Wrong Turn—1E
 (Bombs Away: HIT!)

DEFENDER
 EWR: Moves either AWF or SJF 3 spaces
 A-A: HIT! 10 points
 GOC: Moves SJF 3 spaces
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: 1
 Blue A: Interceptors Sighted—1W
 Red A: 1
 Red B: Avoid Aircraft—1E
 Red C: 1
 Red D: 1
 (Bombs Away: NEAR MISS!)

DEFENDER
 EWR: AWF and SJF can move 3 spaces
 A-A: HIT! 5 points
 GOC: Reporting error—AWF back to base
 AWF: MISS!
 SJF: MISS!

ATTACKER
 Blue D: 1
 Blue C: Navigational Error—1E
 Blue B: Ground Fire—1W
 Blue A: 2
 Red A: 1
 Red B: 1
 Red C: 2
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: Moves one Fighter Squadron 4 spaces
 A-A: HIT! 15 points
 GOC: Permits 1 or 2 altitude changes for AWF and SJF
 AWF: HIT! 15 points
 SJF: HIT! 10 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: Compass Out—1E
 Blue A: 2
 Red A: 1
 Red B: 1
 Red C: Aileron Flutter—1W
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: Inoperative
 A-A: MISS!
 GOC: Unmanned
 AWF: MISS!
 SJF: MISS!

ATTACKER
 Blue D: 1
 Blue C: Crosswind—1E
 Blue B: 1
 Blue A: 1
 Red A: 1
 Red B: 2
 Red C: Drifting—2E
 Red D: 1
 (Bombs Away: NEAR MISS!)

DEFENDER
 EWR: 2 moves for AWF
 A-A: HIT! 5 points
 GOC: 2 Moves for SJF
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 2
 Blue C: 1
 Blue B: Gas Leak—1E
 Blue A: 1
 Red A: 1
 Red B: 1
 Red C: Bad Weather—1E
 Red D: 2
 (Bombs Away: HIT!)

DEFENDER
 EWR: 3 moves for AWF
 A-A: HIT! 10 points
 GOC: 3 moves for SJF
 AWF: HIT! 10 Points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: 2
 Blue B: 1
 Blue A: Bad Engine—2W
 Red A: 2
 Red B: 1
 Red C: 2
 Red D: Oil Leak—1E
 (Bombs Away: NEAR MISS!)

DEFENDER
 EWR: Error—AWF return to base
 A-A: HIT! 5 points
 GOC: Error—SJF return to base
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: Bad Weather—1E
 Blue B: 1
 Blue A: 1
 Red A: 2
 Red B: 1
 Red C: Crosswind—1W
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: Failed to identify Bombers
 A-A: HIT! 5 points
 GOC: Shift not manned
 AWF: HIT! 5 points
 SJF: HIT! 3 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: 1
 Blue A: 1
 Red A: 4
 Red B: 1
 Red C: 1
 Red D: 2
 (Bombs Away: HIT!)

DEFENDER
 EWR: 3 moves for AWF
 A-A: MISS!
 GOC: 3 moves for SJF
 AWF: MISS!
 SJF: MISS!

ATTACKER
 Blue D: 3
 Blue C: 3
 Blue B: 2
 Blue A: 2
 Red A: 3
 Red B: 3
 Red C: 1
 Red D: 3
 (Bombs Away: NEAR MISS!)

DEFENDER
 EWR: 2 moves for SJF
 A-A: MISS!
 GOC: 2 moves for AWF
 AWF: MISS!
 SJF: MISS!

ATTACKER
 Blue D: 4
 Blue C: 3
 Blue B: 1
 Blue A: 2
 Red A: 1
 Red B: 2
 Red C: 3
 Red D: 4
 (Bombs Away: HIT!)

DEFENDER
 EWR: Moves both Fighter Squadrons 2 spaces
 A-A: HIT! 5 points
 G.O.C. Move one Fighter Squadron to any altitude
 AWF: HIT! 10 Points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 3
 Blue C: 2
 Blue B: 1
 Blue A: 1
 Red A: 1
 Red B: 2
 Red C: 2
 Red D: 3
 (Bombs Away: HIT!)

DEFENDER
 EWR: 2 moves for either Fighter Squadron (altitude or space)
 A-A: HIT! 10 points
 GOC: AWF permitted 3 moves
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 3
 Blue C: 3
 Blue B: 3
 Blue A: 3
 Red A: 3
 Red B: 3
 Red C: 3
 Red D: 3
 (Bombs Away: MISS!)

DEFENDER
 EWR: 3 moves for SJF
 A-A: HIT! 5 points
 GOC: 3 moves for AWF
 AWF: HIT! 10 Points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 2
 Blue C: 2
 Blue B: 2
 Blue A: 2
 Red A: 2
 Red B: 2
 Red C: 2
 Red D: 2
 (Bombs Away: NEAR MISS!)

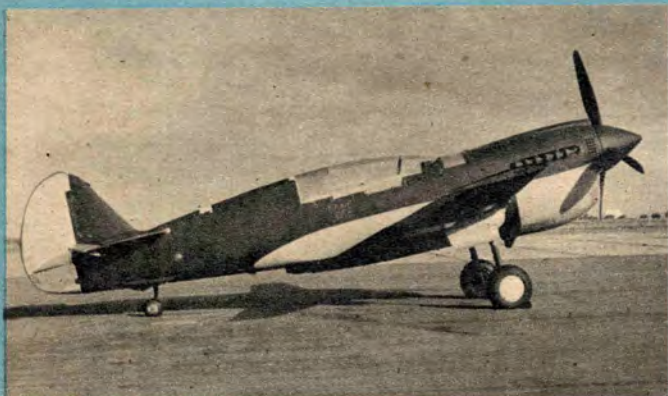
DEFENDER
 EWR: 2 moves for both Fighter Squadrons
 A-A: HIT! 5 points
 GOC: didn't see bombers
 AWF: HIT! 5 points
 SJF: HIT! 5 points

ATTACKER
 Blue D: 1
 Blue C: 1
 Blue B: 1
 Blue A: 1
 Red A: 1
 Red B: 1
 Red C: 1
 Red D: 1
 (Bombs Away: HIT!)

DEFENDER
 EWR: 2 moves for AWF
 A-A: HIT! 10 points
 GOC: 2 moves for SJF
 AWF: HIT! 10 Points
 SJF: HIT! 5 points



USAF KB-29 tanker refueling F-84's and an F-80. System developed by Flight Refueling Ltd. consists of hose and funnel-shaped drogue in streamlined pods in wingtips and fuselage reeled out for refueling.



An old warrior in new dress. A Curtiss P-40 acquired by midget race plane pilot Robert Downey and modified for air racing. Streamlined cockpit canopy cuts down drag. Downey flew famous Minnow in '51.



Latest French military plane, the twin-jet all-weather fighter-bomber Sud-Ouest SO-4050 Vautour. Capable of sonic speeds, will be an important NATO aircraft. Powered by two 6000 lb. thrust ATARS.



Doman's big YH-31 evacuation ambulance helicopter, minus cab. Only helicopter with four-bladed rotor. Powered by 400 hp. Lycoming. Commercial version to be known as LZ-5 will carry ten passengers.

Air

FORECAST and REVIEW

Light Fighters: Possible? Watch this new controversy—it's loaded. Object: to get military to specify, and industry to develop a fighter that can outfly—as well as outfought—the MiG. Industry and military are split down the middle, can't even agree on the need for such a plane. One extreme: a stripped-down, light, small fighter with minimum equipment, maximum performance. Other extreme: large complex fighting machine with maximum equipment *plus* maximum performance. Current trend is still towards latter, but some designers are trying ways to make them less complex. Final answer may never come, but much will be learned along the way. Question: Do you want to beat the enemy on the basis of individual hits, or on the final box-score? Prediction: There won't be any light fighter, but there will be less-complex big ones.

New Planes: North American F-86H Sabre has 9,000-lb. thrust G.E. J-73 t'jet, is bigger and heavier than type now in Korea. New Sabre will slash enemy from two positions: fighter-bomber and day fighter. Indication: Current Sabre is being phased-out as first-line fighter, to be replaced by F-86D all-weather type or later types. . . . New heavyweight is Douglas C-132 designed around 100,000-lb. payload. Class designation: logistics carrier; will tote anything it can lift and act as aerial resupply line. Powerplants are reported to be Pratt & Whitney turboprops of 15,000 hp each. . . . Take-off with the prop feathered? That's what the experimental McDonnell XF-88 modification does. It's being used as a flying testbed for Allison T-38 turboprop; main powerplant is two Westinghouse J-34 jets, used during take-off, landing and routine flight. Purpose of tests: gather data for high-speed turboprop attack plane. . . . Republic's F-84H turboprop modification should be flying by now at Edwards AFB. Three are being built, around the Allison T-54 engine. USAF and Navy sponsor the program jointly, will get results on three prop systems: Curtiss, Aeroproducts and Hamilton Standard.

Shape of Research Problems and program to lick them was spelled out by National Advisory Committee for Aeronautics at biennial inspection tour for industry. NACA is in over its head on the problems of transonic flight, sees no relief in sight as industry continues to demand more and more data in that turbulent speed range. Reason for demand: lack of adequate theory to solve mixed subsonic and supersonic flow patterns. Only test data can do job. One fact emphasizes need for accurate tests: A tiny difference in drag can cause huge speed difference. Host of new stability and control problems are being studied over speed range from zero through high supersonic.

Other NACA Studies: Crash fires. War-weary C-82 and C-46 planes were loaded with fuel, started up and guided down a ramp to crash into barrier rigged to rip tanks open. Motion pictures of crash and fire led to development of inerting system which could be worth its weight in gold in future craft. Fires were kept from starting by system which cut off all electrical services, squirted extinguisher into engine intakes and sprayed water on exhaust rings. . . . Hydro-skis—used by planes for water take-offs—were one byproduct of ditching studies. Dangerous plunging of some aircraft was stopped by use of retractable ski on under surface. Other tests showed ski was useful for take-off, too. Now future fighters and transports will be able to operate from mud, ice, snow, water, muskeg and wet grass. . . . "Flying Venetian blind" was popular—and wrong—name given to research tool

demonstrated in hovering flight at NACA. Four curved wings deflect slipstream from four props downward, produce vertical thrust equal to plane's weight. Thus, hovering. NACA is trying to find what kind of stability and control problems you have at very low forward speed, uses the "blind" as matter of convenience. Overzealous newspapermen picked up weird study configuration of the "blind," billed it as aircraft of the future. But basic idea has been known and understood for at least 30 years.

Turboprops Are Better for U.S. airlines, says C. R. Smith, president of the biggest, American Airlines. He sees such liners as more economical and more efficient than turbojet craft, faster by 100 mph than DC-7 or Super Connie. But we need: solutions for problems of gearbox, props, controls; new kind of prop to use the 7,000 hp Smith expects from tomorrow's turboprops.

More on Missiles: Production Martin Matador (B-61A) features high wing, horizontal tail dihedral. Streamlined fairing covers intersection of vertical and horizontal Tee-tail. Pre-production types had midwing, no dihedral. . . . Interservice row is coming up on responsibility for U. S. missile program. Army wants in on strategic bombing, claims it's just an extension of artillery; USAF and Army both want anti-aircraft job exclusively. This is unification? And maybe with the Navy as referee?

Destruction of X-2, Bell's supersonic stainless-steel rocket research plane was final blow to an often-and-long delayed program. Intended to carry on from where X-1 left off, the bigger swept-wing X-2 was powered by a variable-thrust Curtiss rocket engine. Power-plant delays—caused by somebody's optimism on the tough problems of getting rocket engine to work like any other engine and respond to throttle action—dogged the X-2, which was completed long before bugs were out of engine. Called "world's heaviest glider" by some during engineless wait, the X-2 was just about ready for first flights when explosion blasted it loose from mother B-50 over Lake Ontario. Bell pilot "Skip" Zeigler and flight test engineer Frank Wolko were lost in accident.

Nuclear Power: Negative. Atomic aircraft programs—one with Convair airframe, G.E. engine, the other a study contract with Boeing and Pratt & Whitney—will be cut back to study and research projects with minimum of hardware. Pentagon officials suggest any time lost now can be more than made up later by enterprising American industry. From competent industry and technical observers, this drew only a dirty laugh. The fact: No company, or group of companies, could afford the money required. And you never can buy time. Thus, atomic aircraft program is being sabotaged by the very people whose lives may depend on that program. So is other basic research.

Also in Washington, five senators, a subcommittee of Armed Services Committee, will investigate waste, inefficiency and duplication in all U.S. aircraft programs. . . . Undersecretary of Defense Roger Kyes assures aircraft industry of continued good health, no shutdown like that just after World War II. We'd feel better if assured of continuation of basic research, the lifeblood of tomorrow's progress.

NATO Target: 1,500 first-line jet fighters in service by end of 1956. To reach that goal, European plants are tooling up for these airplanes: Hawker Hunters in England, under license in Belgium and Holland; Hawker Sea Hawks and Supermarine Swifts in England; Dassault Mystères in France; and North American F-86Ds in Italy. Last of these is big surprise, because all earlier talk has been around production of Gloster Javelin all-weather fighter. Officials decided that F-86D was nearer a production item than Javelin, gave it the nod.—DAA



Navy's newest helicopter, Kaman HO4S, is for general utility and ambulance service. Powered by 500 hp nine-cylinder radial Continental engine. Servo-flaps on intermeshing rotors give hands-off stability.



Sud-Ouest SO.95 equipped with bicycle type landing gear. This is a test aircraft on which gear was perfected prior to installation on Vautour twin-jet fighter. The gear itself built by Hispano-Suiza firm.



Thalman T-4, wood, plastic and aluminum 4-place personal plane built by H. J. Thalman of Salt Lake City. Has retractable gear, 135 hp Lycoming engine buried in fuselage nose. Cruising speed is 150 mph.



Chase C-123B, production version of the Avitruc. Has increased tail area over earlier model, 3200 lbs. more weight. To be built as commercial plane with Wright turbo-compound and Allison turboprop engines.

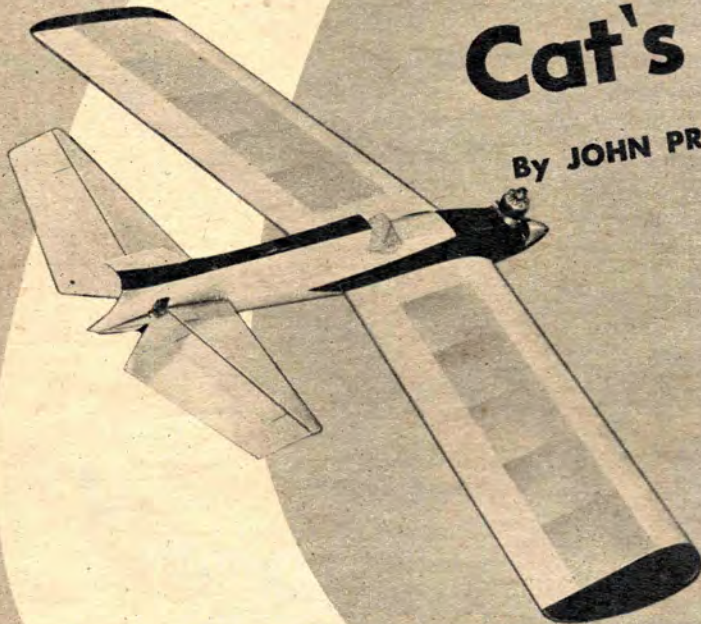
One of the best looking and best performing combat designs to come your way, this modern "fighter" model is a cinch to make



SWEPT-WING STUNTER

Cat's Whiskers

By JOHN PRECHTL and ART HASSELBACH



■ The main purpose in designing the *Cat's Whiskers* was the desire for originality. However, its flying characteristics resulted in the immediate construction of two additional ships. Powered with .19-.35 engines, the planes perform complete stunt patterns; with the higher displacement engines they are ideal combat ships. Rugged construction tends to lengthen the relatively short lifespan of the average combat model. Yet, this one remains simple to construct and retains sleek lines.

The plane is an all-round good performer, and is sure to draw a crowd at any field. Speed varies according to the size of engine installed and ranges from 60-80 mph. The eventual success of any ship is up to the builder, so from here on it is up to you. Follow the plans to the letter, especially concerning balance and bellcrank installation and you won't go wrong.

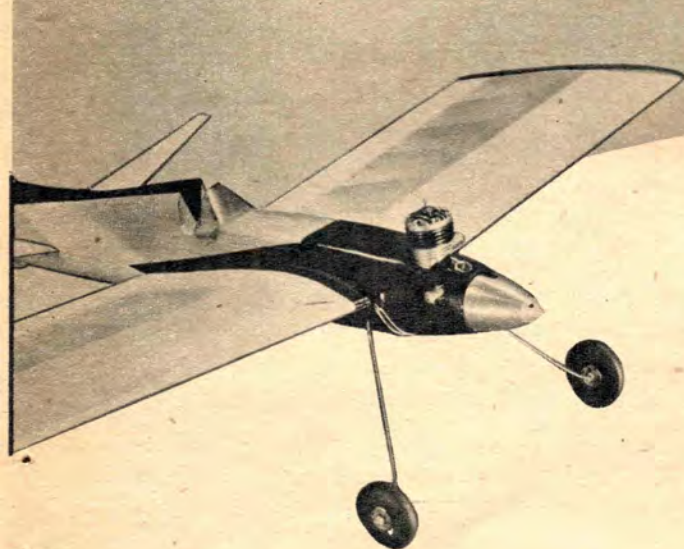
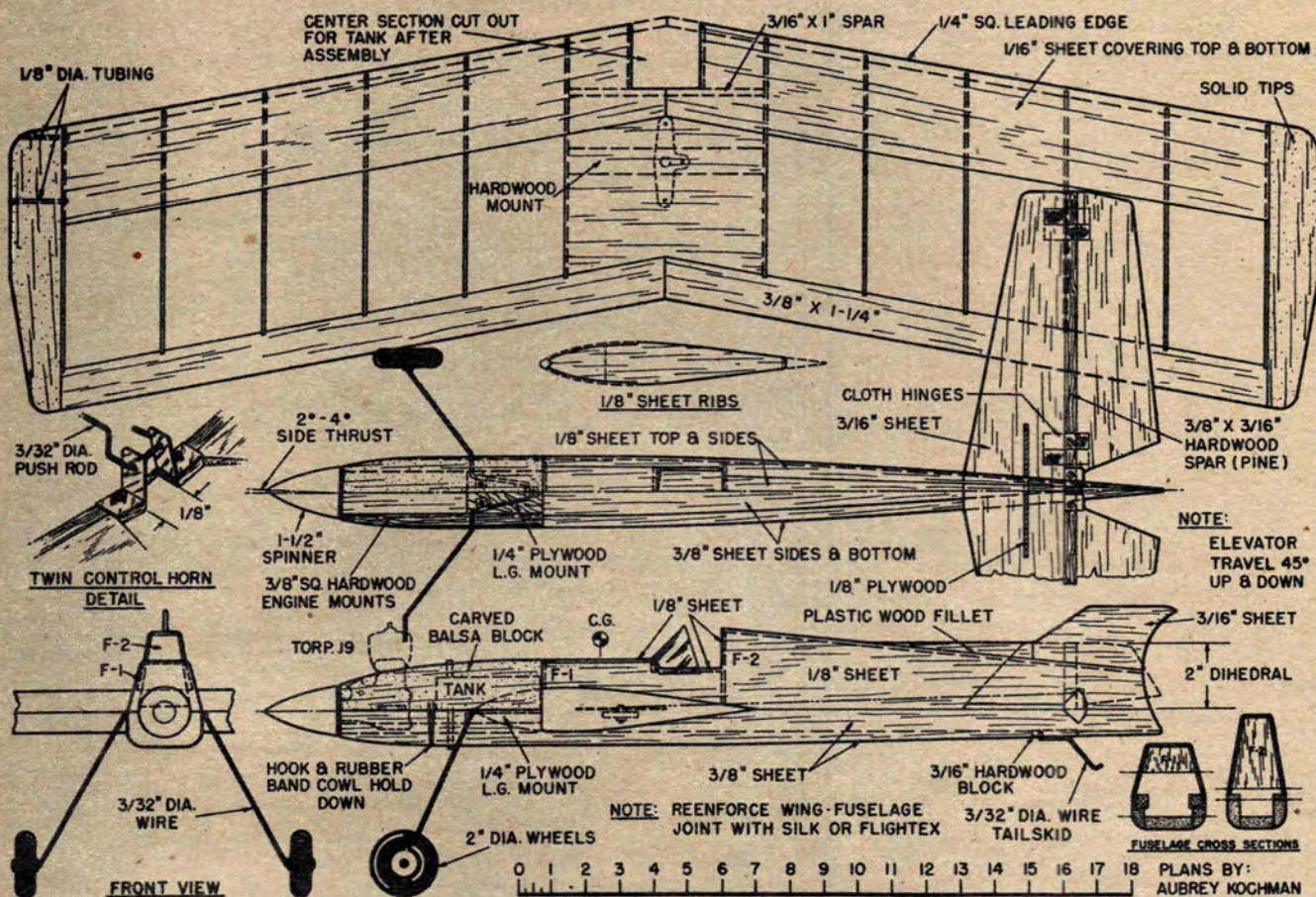
Start with the wing. Construction is fairly simple, and self-explanatory. However, care should be exercised in laying out the sweep-back. First measure back $3\frac{1}{4}$ " at the tips, and lay out the leading edge. Place the ribs in position, glue on the trailing edge, and install the spar and top planking.

When the framework has dried, invert it and install the bellcrank and lead-outs. You are now looking at the top of the wing. Glue on the leading edge planking and the solid wingtips. Cut out the center sections of

the leading edge to allow for the tank installation. Seal off the tank compartment by installing false ribs back to the spar as shown. Leave off the center section planking over the bellcrank until the pushrod has been installed. This will be done after the wing is glued onto the fuselage bottom.

Cut the elevator parts to shape, and glue the hardwood strips onto the elevators. A plywood brace is used for added strength on the stabilizer, and if cut to an angle of 25 degrees will match the dihedral angle. The twin control horns are bolted in place and the elevators hinged to the stabilizer.

The fuselage bottom half is built first. Sides and bottom are cut to shape and bottom is glued in place.



Grooves are cut in the sides to facilitate a rugged engine installation. The landing gear is bolted to a piece of $\frac{1}{4}$ " plywood by means of three clamps or a single sheet of thin aluminum. Be sure to recess the landing gear wire below the level of the motor mounts so as not to interfere with the tank installation.

The wing and elevator are now positioned. The push-rod is installed with a wide U-shaped bend to allow movement of the two control horns without jamming. This clearance is vital, as the horns will spread apart when the elevator is moved to a down position and come together when moved to an up position.

The planking is installed on the wing center section and the sheets which make up the top half of the

fuselage are shaped and glued in place. Assemble the fuselage top and bulkheads around the cockpit. The rudder is glued on and the cowl carved.

The plane is now ready for covering, doping, and fuel proofing. All that remains to be done is the flying. We're quite sure there will be no disappointment in the ship's performance, or the many hours of enjoyment obtained from it.

BILL OF MATERIALS

(Balsa unless otherwise specified)

Elevators: $1 \frac{3}{16}$ " x 3" x 36". $1 \frac{3}{16}$ " x $\frac{3}{8}$ " x 18", pine.
 Wings: $2 \frac{1}{4}$ " sq. x 36", L.E. $2 \frac{1}{4}$ " x 2" x 36", ribs. $4 \frac{1}{16}$ " x 3" x 36", planking, L.E. and center. $1 \frac{1}{4}$ " x $\frac{3}{8}$ " x 37", T.E. $1 \frac{1}{2}$ " sq. x 18", tips.
 Fuselage: $1 \frac{3}{8}$ " sq. x 12" hardwood mounts. $2 \frac{3}{8}$ " x 2" x 36", sides and bottom. $1 \frac{1}{8}$ " x 3" x 36", sides of top. $1 \frac{1}{8}$ " x 2" x 36", top. $1 \frac{1}{2}$ " sq. x 6", cowl.



Official AMA Modelplane Rules

Provisions for issuance: Under authority of the National Aeronautic Association, American representative of the Federation Aeronautique Internationale, world-wide governing body for all sporting aviation, the following model aircraft classifications and regulations are hereby prescribed by the Academy of Model Aeronautics. Copyright 1953 by the Academy of Model Aeronautics, 1025 Connecticut Ave., N.W., Washington 6, D.C.

PROXY FLYING. A proxy flyer may be designated by the builder only in those cases where the Contest Director is convinced of the physical inability of the builder to fly the model himself.

TEAM ENTRY. Where two or more license-holders enter competition as a team, all shall have taken active part in the construction of the model(s). One team member is to be designated to fly the model(s); however, entry should be made in the age group of the oldest team member and in the name of the team, with its individual members' names listed, and all awards given or records established must be made in the name of the team. No license-holder shall be permitted to enter an event both as an individual and as a team member.

NUMBER OF MODELS. Except as specified for indoor and outdoor hand-launched glider, Wakefield rubber, Nordic glider and combat categories, each contestant may enter no more than one model in each event. If event is one in which classes or categories are combined, the model may be one of any of the classes or categories which have been combined.

DISQUALIFICATION; EXCLUSION. Contestants may be disqualified or excluded from any or all events if guilty of an infraction of contest rules or of unsportsmanlike or discourteous conduct. If, after entry in an event, a contestant is found ineligible to compete in that event, all of the contestant's flights in that event are to be cancelled and any awards won in that event returned. If judged guilty of wilful misconduct, the contestant shall lose all claim to awards, and shall be liable to expulsion from the contest site. Models damaged in landing are not to be disqualified.

PROTESTS. Protest will be considered only when presented in writing to the Contest Director within one hour after the close of the contest or Record Trials. The protestant must report in full the action or decision, the names of entrants and officials involved and complete details.

APPEAL. Appeal may be made to the Contest Board of the Academy of Model Aeronautics on action taken on a protest. Such appeals must be made in writing within a three-day period following the action of the local contest committee on the original protest.

INTERPRETATION OF REGULATIONS. The Contest Board of the Academy of Model Aeronautics shall be the final authority in the interpretation and execution of these model aircraft classifications and regulations.

AMENDMENTS TO REGULATIONS. Beginning with 1951, these model aircraft regulations may be altered only every other year by a vote of the AMA Contest Board.

Records

NATIONAL RECORDS. Perpetual American model aircraft duration and speed records are homologated by the Contest Board of the Academy of Model Aeronautics. Perpetual records may be established at any time and shall continue until exceeded or affected by changes in the Official Regulations.

ACCEPTANCE OF RECORDS. No record is official until it has been homologated by the Contest Board of the Academy of Model Aeronautics. Only duration and speed records for model aircraft are officially recognized. All records to be eligible for recognition must be made in sanctioned competition in which there are 10 or more contestants who have presented models for processing and which are conducted under the regulations of the Academy of Model Aeronautics.

General

TUBE. A tube which is formed from sheet material shall not be considered as being built-up.

CHANGING STICK AND FUSELAGE MODEL. No parts shall be added to or taken from a stick model to qualify it as a fuselage model; no parts shall be added to, or taken from a fuselage model to qualify it as a stick model.

GASEOUS BOOSTS. Models utilizing gases other than air in their combustion engine(s) shall not be permitted in any sanctioned competition.

METAL BLADED PROPELLER(S). Propeller(s) utilizing metal blades shall not be permitted in any sanctioned competition.

RADIO-CONTROLLED MODELS. Radio-controlled models shall not be entered in regular free flight events where scoring is based on elapsed time.

ACCEPTABLE TYPES. Only those types of model aircraft described herein are acceptable for official competition and record purposes. Acceptable for competition, if constructed and flown in accordance with AMA Regulations, are radio-controlled models, control line precision models, free flight and control line flying scale models, combat and team racing models.

Control Line Precision Acrobatic Regulations MANEUVERS

1. Starting. Take-off within one minute from starting time. (The time allowed to obtain 5 points for getting the plane airborne within 1 minute, starts when the contestant or mechanic begins cranking the engine. The contestant has a total of 3 minutes to get the plane into the air from the time the handle is placed in the

center of the flight circle. Failure to become airborne within the 3 minute limit, will constitute an attempt.)

Maximum 5 points. Minimum 0 points.

2. Take-off. A correct take-off is judged when the model rolls smoothly forward, lifts into the air and climbs steadily to normal flight in approximately $\frac{1}{4}$ lap.

Maximum 5 points. Minimum 1 point.

Errors. Model wobbles, bounces, or climbs unsteadily -2. Model is instantly airborne -2.

3. Normal Level Flight. Correct normal level flight is judged when the model flies two smooth stable laps at shoulder level or four feet, whichever is greater.

Maximum 5 points. Minimum 1 point.

Errors. Model flies the laps more than one foot above or below normal flight -2. Model wobbles or varies in altitude more than two feet -2.

4. Climb. A correct climb is judged when the model starts from normal flight, makes a smooth precise change of direction into a vertical climb, climbs vertically for at least twenty feet, and makes a smooth recovery into level flight, with the line(s) inclined at an angle of 45 deg. or less to the ground. Level flight is maintained at this altitude for at least three laps before making Dive.

Maximum 10 points. Minimum 2 points.

Errors. Model starts from other than normal flight, wobbles, or mushes going into climb -2. Climb is not vertical -2. Model travels less than twenty feet vertically -2. (If the plane does not climb vertically four points are lost, but vertically less than twenty feet, only two points are lost.) Model wobbles or mushes on the recovery or recovers above 45 deg. -2.

5. Dive. A correct dive is judged when the model starts from level flight at the approximate altitude of the climb recovery, but with the line(s) inclined at an angle of 45 deg. or less with the ground, makes a smooth precise change or direction into a vertical dive, dives vertically for at least twenty feet, and makes a smooth recovery into normal level flight.

Maximum 10 points. Minimum 2 points.

Errors. Model starts dive above 45 deg. point, wobbles, or mushes going into the maneuver -2. The dive is not vertical -2. Model travels less than twenty feet vertically -2. Model wobbles, mushes, or recovers at other than normal flight level -2.

6. Wing-over. A correct wing-over is judged when the model, starting from normal level flight, makes a vertical climb and dive, passing directly over the flyer's head, cutting the ground circle in half, and recovers in normal level flight.

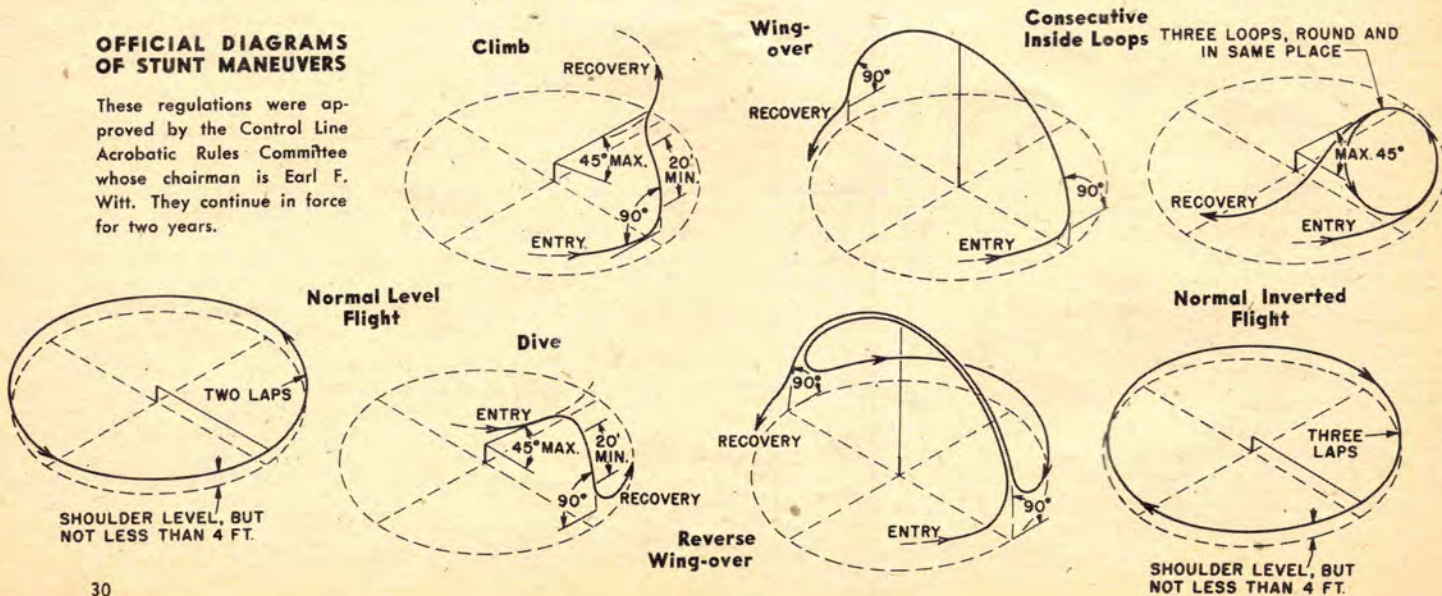
Maximum 10 points. Minimum 2 points.

Errors. Model starts at other than normal level flight, wobbles or mushes going into climb -2. Model does not cross directly over flyer's head -2. Model does not cross the circle in a straight line -2. Model wobbles, mushes, or recovers at other than normal flight level -2.

7. Reverse Wing-overs. Correct reverse wing-overs are judged when model starts from normal level flight, makes a vertical climb and

OFFICIAL DIAGRAMS OF STUNT MANEUVERS

These regulations were approved by the Control Line Acrobatic Rules Committee whose chairman is Earl F. Witt. They continue in force for two years.



dive, passing directly over the flyer's head, cutting the ground circle in half, and recovers in an inverted position at normal flight level. The model continues for half a lap inverted, to the starting point, then makes a vertical climb and dive over the center of the circle from inverted flight and recovers in normal level flight.

Maximum 20 points. Minimum 4 points.
Errors. First Half: Model starts at other than normal level flight, wobbles, or mushes going into climb -2. Model does not cross directly over flyer's head -2. Model does not cross circle in a straight line -2. Model wobbles, mushes or recovers at other than normal flight level in an inverted position -2. **Second Half:** Scored same as first half, reversing the entry and recovery positions.

8. Consecutive Inside Loops. Correct loops are judged when model starts from normal level flight and makes a series of three smooth, round loops, all done in the same place with the line(s) at no time exceeding an angle of 45 deg. with the ground. The model then continues for another half loop, recovering inverted and descending to normal flight level, flying two laps before being judged for **Normal Inverted Flight**.

Maximum 20 points. Minimum 4 points.
Errors. First Loop: Loop is rough or irregular -2. Lines go above 45 deg. -2. **Second Loop:** Loop is not in the same place as previous loop -2. Loop is rough or irregular -2. Lines go above 45 deg. -2. **Third Loop:** Scored same as second loop. (Examples—A flyer who goes too high on first loop and corrects on second will lose 4 points (2 on first, 2 on second) because of loss of consistency points on second loop.)

9. Normal Inverted Flight. Correct inverted flight is judged when plane makes three smooth, stable laps at shoulder level or four feet, whichever is greater.

Maximum 20 points. Minimum 4 points.
Errors. First Lap: Model flies over one foot above or below shoulder level -2. Model altitude varies more than two feet -2. **Second Lap:** Model flies at an altitude other than that of previous lap -2. Model flies over one foot above or below shoulder level -2. Model altitude varies more than two feet -2. **Third Lap:** Score same as second lap (-6).

10. Consecutive Outside Loops. Correct loops are judged when model starts from inverted position at normal flight level and makes a series of three smooth, round loops, all done in the same place with the lines at no time exceeding an angle of 45 deg. with the ground. The model then continues for another half loop, recovering in normal flight.

Maximum 20 points. Minimum 4 points.
Errors. First Loop: Loop is rough or irregular -2. Lines go above 45 deg. -2. **Second Loop:** Loop is not in the same place as previous loop -2. Loop is rough or irregular -2. Lines go above 45 deg. -2. **Third Loop:** Scored same as second loop (-6).

11. Square Cornered Loop. A correct loop is judged when the model starts from normal level flight, makes a vertical climb, levels off inverted with the lines at 45 deg. or less with the ground, flies inverted approximately the same distance

as the climb, makes a vertical dive, and recovers into normal level flight. All corners must be smooth, precise, and of approximately five foot radius.

Maximum 20 points. Minimum 4 points.
Errors. Model starts from other than normal level flight, wobbles, or mushes on the first corner -2. Model does not climb vertically -2. Model levels off inverted with lines above 45 deg., wobbles or mushes on second corner -2. Model does not fly smooth and level while in inverted position -2. On third corner lines are above 45 deg. with the ground, plane wobbles or mushes -2. Model does not dive vertically -2. Model wobbles, mushes, or does not recover in normal level flight on fourth corner -2. Model does not fly smooth and level to starting point -2. Corners are scored in error for exceeding seven foot radius. (Example: The flyer will lose 4 points for exceeding 45 deg. since he will lose either points on both corners or one corner and horizontal flight.)

12. Horizontal Eights. Correct eights are judged when the model makes two eights, each consisting of two round circles or loops of the same size, tangent to each other, and in a horizontal line. The model must enter the eight from normal flight and be vertical at the intersection point or tangency of the circles. The eights must be symmetrical and the line(s) cannot exceed an angle of 45 deg. with the ground.

Maximum 40 points. Minimum 8 points.
Errors. First Half of First Eight: Model is not vertical at the intersection on entry -2. Loop is rough or irregular -2. Angle of the lines exceeds 45 deg. -2. **Second Half of First Eight:** Model is not vertical or in the same place as entry or previous intersection -2. The loop is rough or irregular -2. Loop is not of the same size as the preceding loop on the opposite side of the eight -2. Angle of the lines exceeds 45 deg. -2. **First and Second Half of Second Eight:** Scored same as second half of first eight, excepting an additional error will be scored if the plane is not vertical at the intersection on the recovery -2.

13. Vertical Eights. Correct eights are judged when the model makes two eights, each consisting of two round circles or loops of the same size, tangent to each other, and in a vertical line. The model must enter the eight from normal flight and be horizontal at the intersection point or tangency of the circles. The eights must be symmetrical and the model cannot go beyond the center of the circle vertically over the flyer's head.

Maximum 40 points. Minimum 12 points.
Errors. First Half of First Eight: Model is not horizontal at the intersection on entry -2. Loop is rough or irregular -2. Loop goes past the vertical -2. **Second Half of First Eight:** Model is not horizontal or in the same place as entry or previous intersection -2. Loop is rough or irregular -2. Loop is not of the same size as preceding loop on opposite side of eight -2. **First and Second Half of Second Eight:** Scored same as second half of first eight, excepting errors are scored for going past the vertical -2; and model not being horizontal at the intersection on recovery -2.

14. Overhead Figure Eights. Correct overhead eights are judged when the model makes two eights, each consisting of two round circles of the same size, with the intersection or point of tangency directly over the flyer's head. The model must enter the eights from normal flight with a vertical climb through the center of the circle and must always point in this direction at the center of the eights. The eights must be symmetrical and the line(s) must exceed an angle of 45 deg. to the ground at all times.

Maximum 40 points. Minimum 8 points.
Errors. First Half of First Eight: Model does not enter eight in a straight line directly over the flyer's head -2. The circle is rough or irregular -2. The angle of the lines drops below 45 deg. -2. **Second Half of First Eight:** Model not pointing in the same direction as entry and directly over the flyer's head at intersection -2. The circle is rough or irregular -2. Circle is not of the same size as the preceding circle on the opposite side of eight -2. The angle of the lines drops below 45 deg. -2. **First and Second Half of Second Eight:** Scored same as second half of first eight, excepting an additional error will be scored if the plane is not pointing in the same direction as the entry on the recovery -2.

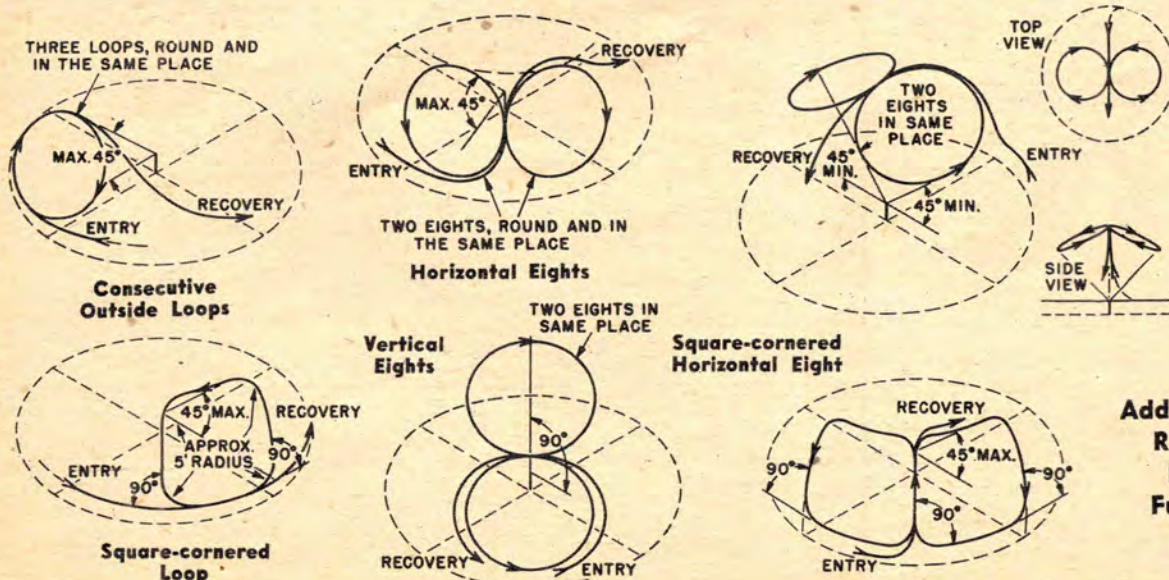
15. Square Cornered Horizontal Eight. A correct eight is judged when the model starts from normal level flight and makes a correct square cornered loop followed by a reversed or outside square cornered loop with the start and ending of the first and second loop in a vertical climb and at the same point. The line(s) must not exceed an angle of 45 deg. to the ground and all corners must be smooth, precise, and of approximately five foot radius.

Maximum 40 points. Minimum 8 points.
Errors. First Half of Eight: Model is not vertical in entry -2. Model levels off with lines above 45 deg., wobbles, or mushes on corner -2. Model does not fly smooth and level on top of loop -2. On second corner, lines are above 45 deg. with the ground, model wobbles or mushes -2. Model does not dive vertically -2. Model wobbles or mushes or does not recover in level flight on third corner -2. Model does not fly smooth and level on bottom of loop -2. Model wobbles or mushes or does not climb at point of entry on fourth corner -2. **Second Half of Eight:** Scored same as first half. Corners are also scored in error for exceeding seven foot radius.

16. Landing. A correct landing is judged when a model lands with no bounce or roughness and rolls to a smooth stop.

Maximum 10 points. Minimum 0 points.
Errors. An error is scored any time the plane bounces or touches any part to the ground, other than the landing gear, each -2. Crash, flipping over, or belly landing voids landing score.

Notes: Contestants may fly as many laps as desired for warm-up and testing. If your model flies fast, it is suggested that you do several laps between maneuvers in order to give the judge time to complete his scoring. Illustrations are for counter-clockwise flight and are reversed for clockwise flying.



Additional AMA Rules Will Be Presented in Future "AT's"

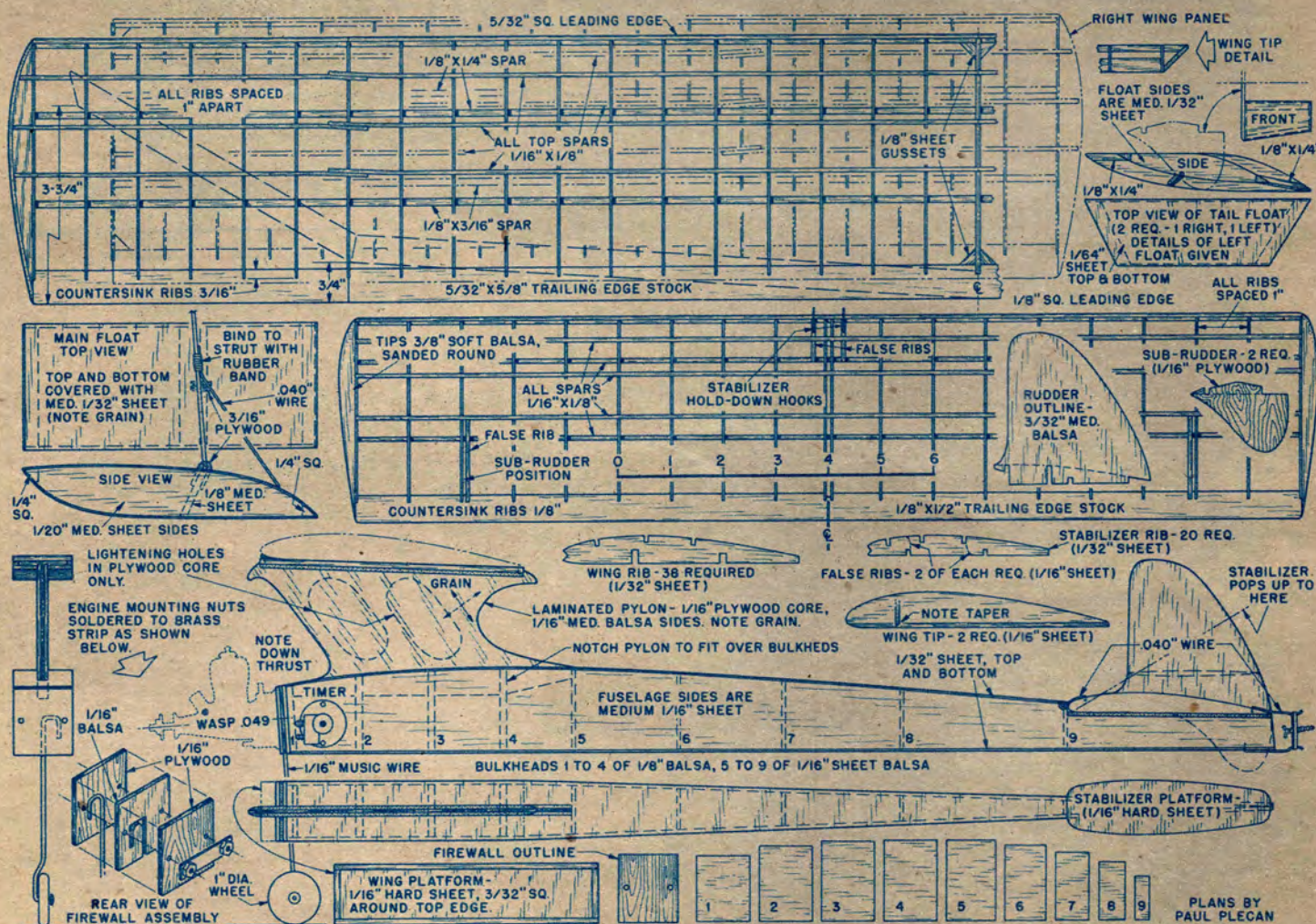


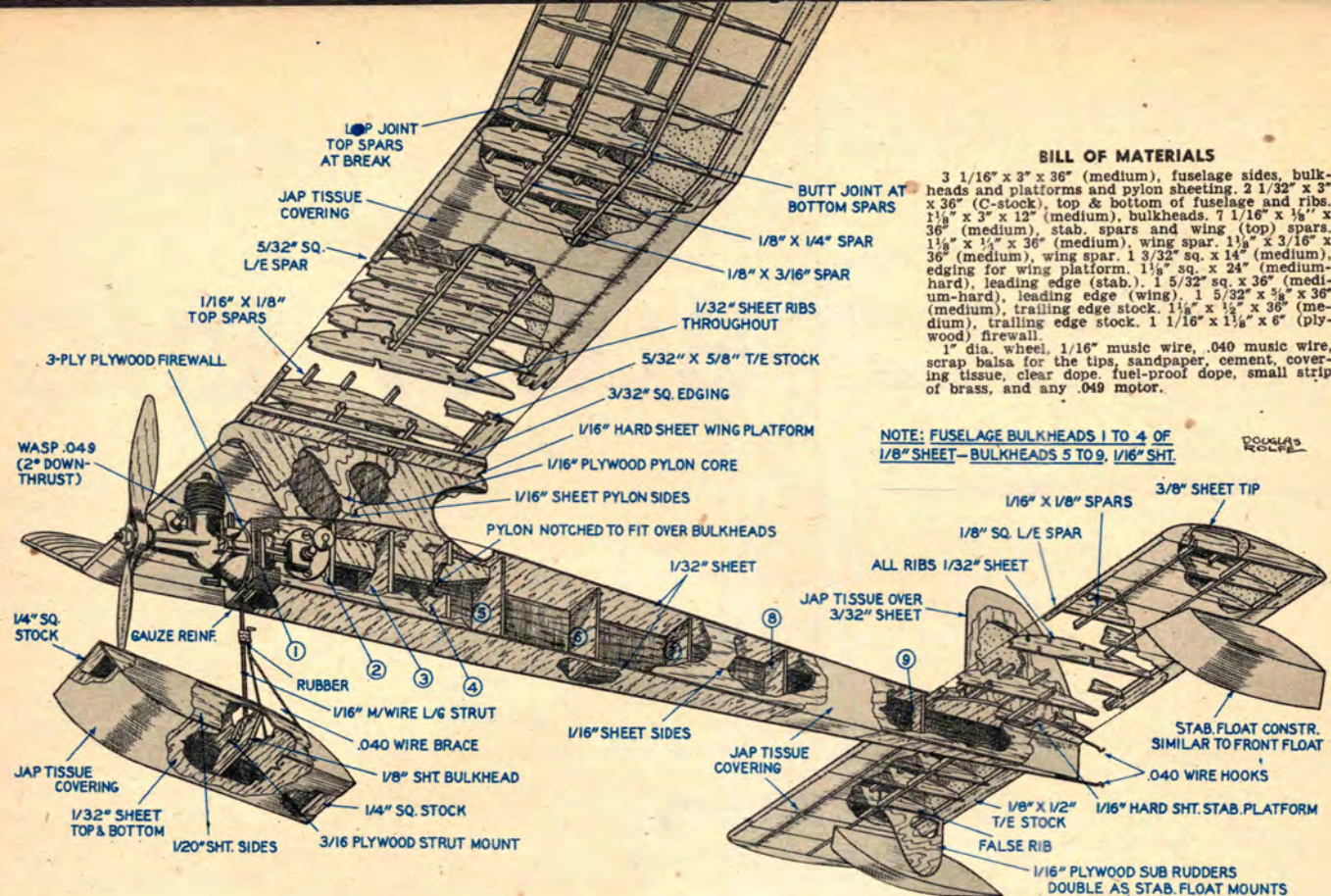
Outstanding Half-A Hydro from Ohio:

PAST DUE

By HOWARD L. ROBINSON

"Howie" Robinson, the Flying Milkman from Shelby, Ohio, is nationally known rubber model and glider contestant. A member of the Shelby Balsa Butchers, he is a "flying partner" of Dick Korda and a long-time A.M.A. leader member.





This proven contest winner can fly off-the-ground or as a rise-off-water job

■ *Past Due* is a high-performance A/2 contest type free flight model, capable of a fast climb under power and a very flat glide. It was designed for easy construction, durability, lightness and dependability. The multi-spar wing and stabilizer have stood the rough conditions of contest work and proved themselves warp-free. The model in the picture has been shipped to both coasts and to Texas via railroad, automobile and airlines without a trace of warps in either the wing or stabilizer.

This ship is equally at home on land or sea, having been flown in both the ROG and ROW events at two National Contests. Last year at Los Alamitos it weighed in at 5 oz. on the nose with floats and turned in a time of 13 minutes plus on three flights ROW.

The balsa used throughout is medium firm unless otherwise noted on the plans. Start by cutting out the two fuselage sides and the bulkheads from 1/16" medium sheet.

Mark off the bulkhead stations on the sides before cementing in place. Note: be sure to keep the fuselage sides square. Cut out the plywood core (1/16" ply) for the pylon including the lightening holes, then laminate both pylon sides with 1/16" sheet balsa (note grain). After cementing, lay a weight of some sort on the pylon while it's drying. When dry, notch pylon to fit over bulkheads—at this point be sure to keep the same wing incidence as is on the plans—and cement in place using plenty of cement.

Sheet the top and bottom of the fuse-

lage with 1/32" sheet balsa (note grain), leaving a small section open on the bottom and to the front of the fuselage until firewall is cemented in place. Cut out wing and stabilizer platforms and cement in place. Use plenty of cement to form a fillet. Use 3/32" square for edging of the wing platform. Cut three pieces of 1/16" plywood to size for the firewall, bend the landing gear wire (1/16"), and cut out middle piece of plywood to fit gear; now sandwich together using cement liberally, and clamp in vise until dry. Cement firewall assembly to fuselage; when dry, drill holes for your particular motor including the brass strip on which the nuts are to be soldered. Solder nuts to strip and cement into fuselage (on back of #1 bulkhead).

Cover the section that was left open on bottom of fuselage. Cut out the hole for the timer. Cement a piece of gauze around firewall to sides of fuselage. Sand entire fuselage with fine sandpaper and cover with Jap tissue for strength. Give the fuselage a coat or two of sanding sealer, sanding between coats, and finish off with one or two coats of fuel-proof dope (colored or clear). Mount timer and dethermalizer hooks, engine, solder on wheel—and the fuselage is completed.

The stabilizer is constructed by pinning down the notched trailing edge stock and the two lower spars. Cement the ribs and false ribs in place and then add the 1/8" square leading edge and top spars. Remove when dry and add the tips (sand round). Sand the entire stabilizer lightly and cover with Jap tissue or rubber-weight Sky Sail. Shrink with water and

when dry give two coats of clear dope. Cut out rudder, sand to shape and cover with tissue, give two coats of dope and then cement into place between the two center ribs of the stabilizer. Add the 1/16" plywood sub rudders and fuel-proof the entire tail section.

If the wing is to be constructed in full at one time, make a rough drawing of the right wing panel to join the left. Construction is the same as the stabilizer with the exception of the tips (see detail), and the top spars which are added after the dihedral has been cemented into wing. At the polyhedral breaks the top spars are crossed and cemented for strength. The entire wing should be sanded lightly before covering with tissue. After covering, shrink with water and follow the same procedure as with the stabilizer.

When assembling the completed model be sure to key the wing and stabilizer to the fuselage with a split dowel.

The finished model should balance one and one-eighth inches in from the trailing edge. Hand glide over high grass; make sure that the glide is slow, almost to the stalling point. Tilt the stabilizer to give a left circle in the glide. Power flights should be started with motor runs of five to seven seconds. The power circles are to the right in wide circles. This model climbs on its wing and not on the propeller, and should consistently turn in flights of over two minutes in calm air.

With this model as well as with any other presented in AT, the Editors would like to hear of your flight performances. Write 'em!

AT LAST! A Basic Free Flight Pressure Jet You Can Build . . .



BLOW BUG

Here's one modeler's answer to the coming age of all-jet flight

■ This turbine jet model is somewhat unique in that it belongs to the pressure jet category rather than to the ducted fan class with which most model turbine jet experiments have been made. Instead of an axial flow fan mounted within a tube to accelerate a flow of air, this model uses a centrifugal impeller to pump its fuselage full of pressure to supply a nozzle with air for reactive propulsion.

We chose this configuration for two reasons; first because of its extreme simplicity, second because we wished to introduce something newer in the line of turbine jet models: while quite a bit has been done with ducted fans, this is the first pressure jet job we know of.

While theory gives the ducted fan an edge, on paper, practical considerations tend to favor the pressure jet. It does not require round sections, take-apart fuselages, tricky constructions or difficult starting or servicing procedures. It is also easier to mount the intake in a position which minimizes sucking up debris. (If you have never nosed over a turbine jet model in a snowbank or gravel pit, you have no idea how horrible life can get.)

Blow Bug is, therefore, a simple straightforward basic model with accent on serviceability and a performance margin that insures good results to those who have never built this sort of thing before.

Begin construction with the fuselage. As with any sheet balsa job, careful attention to wood grades will pay big dividends in performance. Use a light, yet strong grade of balsa. To insure a good fit at the hatch, build up the center part of the fuselage first, cementing the bulkhead and the crosspiece upon which the front of the wing rests to the sides to give a starting place. The bottom section of the fuselage is partly covered with 1/16" or 3/32" plywood for the engine bed, and this is braced at the corners with 3/16" sq. bearers. Study the plan and note how the sliding hatch goes in place. This is a very simple deal, but a snug fit is essential to minimize air leakage, and to hold the hatch in place when the motor is running.

Sheet up the top and bottom of the fuselage, except at the wing station, then bend the front inward as shown and cover this portion. Wetting the wood may help the bending job, but we didn't find it necessary on the original. Be sure the inside diameter of the tail nozzle is 3/4" sq. This dimension is quite important for good performance.

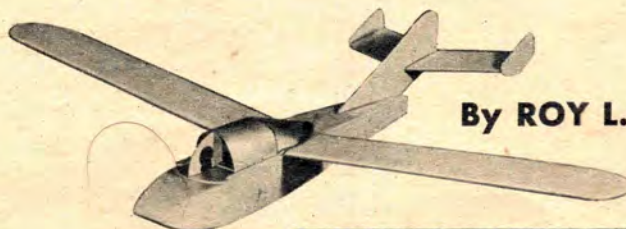
The wing is a simple glider-type sheet balsa affair which is cemented into the fuselage. Any small openings which show as a result of dihedral angle should be cement-skinned over. Fair in the turtle-back with stiff paper and fit the hatch and scoop arrangement to the model at this point. Allow the cement to set for a few hours and then fuel-proof the inside of the model by pouring clear Sta through it and sloshing it around. Do not omit this step because otherwise an untreated inside will pick up a surprising amount of weight from oil absorption, enough to change the flight trim to tail-heavy after a couple dozen flights.

Make up the tail surfaces and attach,

noting that the front of the stabilizer is not cemented in place yet. No offsets are required since the gyroscopic action of the blower tends to bank the model to the right as it climbs—provided all surfaces are true.

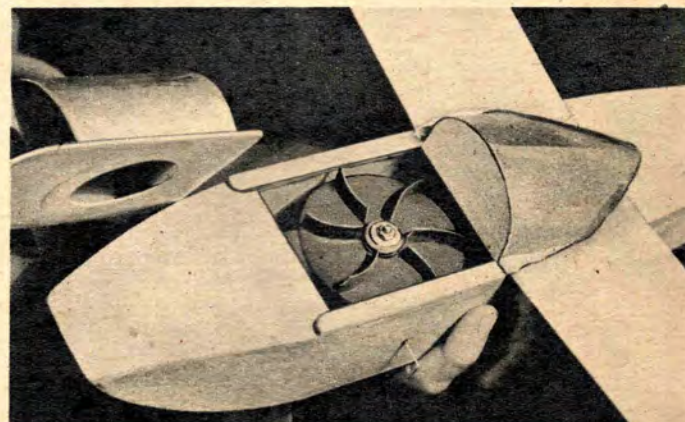
Next mount the engine, taking care to align the shaft centered with the blower diaphragm opening (that 1 5/8" hole in the hatch). Mount the tank at one side with the filler at the front for easy fueling with the blower in place. (The original model used an Infant Torp tank with a Wen-Mac engine giving a good run, but not too long.)

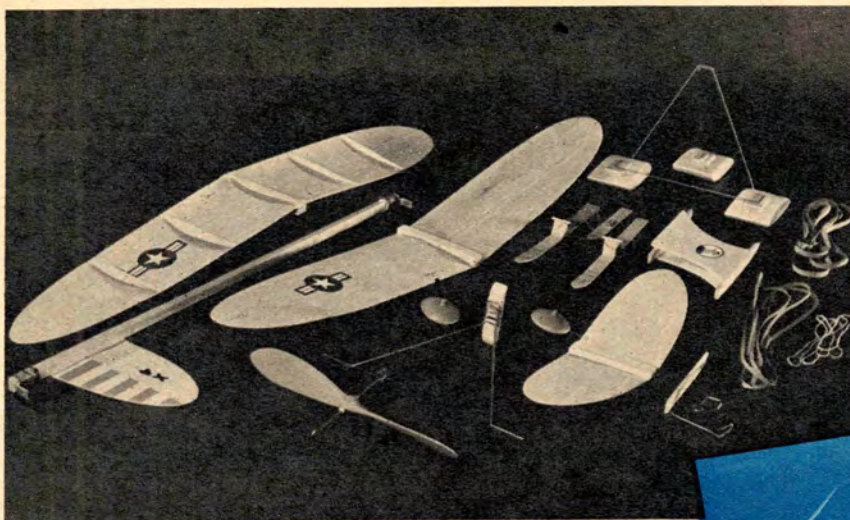
Don't let construction of the blower, or centrifugal impeller which is the heart of the system worry you. Just cut a disk of .025 stock and solder the blades in place using a good flux. Be sure to do a good soldering job, since a blade coming off could wreck the model. With a good job the blower is safe at any speed a small engine can spin it. We have used a number of such blowers, many of them turning much faster than this (Continued on page 74)



By ROY L. CLOUGH, JR.

About any .045 cubic inch displacement engine can be used in this model whose "dry" weight is about 5.5 oz. Don't let the blower scare you off. It's not difficult to build, although you should take special care with the soldering operation. The author found starting to be quite simple. You spin the blower with a finger from back of model to front. The lighter you make the model the better its performance, but the more fragile it gets.





A wonderful project for the beginning modelers in your organization; many variations mean much fun

Combo Trainer for Clubs...

ESPECIALLY for BEGINNERS

■ Perhaps *Combo-Plane* sounds like an old name; it probably is, but we are about to describe an odd airplane. It can be a monoplane, biplane, pusher, tandem, with about a dozen different variations—all by juggling the components.

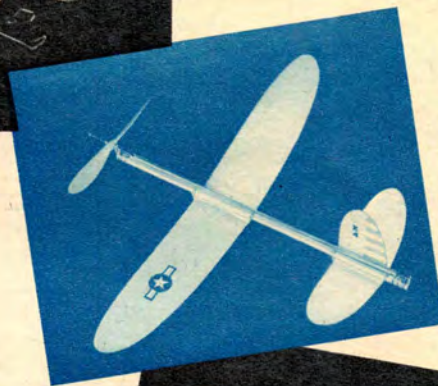
Actually, this isn't intended as a flying puzzle—it has a very real mission in life. Did you ever have a yen to try out a new configuration, but hesitated to butcher one of your regular stable of planes? Perhaps you wanted to test that odd Delanne biplane design, but didn't have enough wings. Or, you became interested in pushers but had no engine (or prop) that would go backward.

The answer to these and many other problems is the *Combo-Plane*. Rather than slap one together quickly, we suggest you take pains with the job, for this convertible plane will prove invaluable as an experimental medium. It isn't something to rush through, fly a few times, then discard. It will take you and your club many fascinating hours to work out the best adjustments for just the few combinations we've mentioned, and there are literally hundreds more. After checking wing incidence, balance, power and torque considerations of the pusher setup, for example, you can answer questions with authority. Should someone ask what will happen if he increases the incidence of the forward wing on a pusher, you won't have to say, "Uh . . . why, it'll stall . . . I guess." You'll know!

To keep the whole job as simple and rugged as possible, we built it all from balsa, and used a simple stick fuselage. The latter is a bit unusual in that it has a prop hanger fore and aft. Similarly, the propeller has a shaft and hook in front and back, so it can either push or pull. The motor stick is medium balsa, $\frac{3}{8}$ " x $\frac{1}{4}$ " in cross-section. The $\frac{3}{8}$ " sides are horizontal and serve as ample support for the many components that may be fastened to the stick.

The two prop hangers are $\frac{1}{4}$ " x $\frac{1}{16}$ " aluminum, bound and cemented in place. Tin can metal doubled over for strength will do as well, but is heavier.

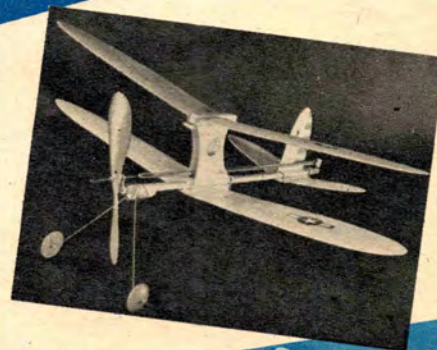
The tail hook is removable; it, too, can be shifted to either end of the "airplane." Bend to (Continued on page 79)



Classic, conventional type tractor without landing gear.



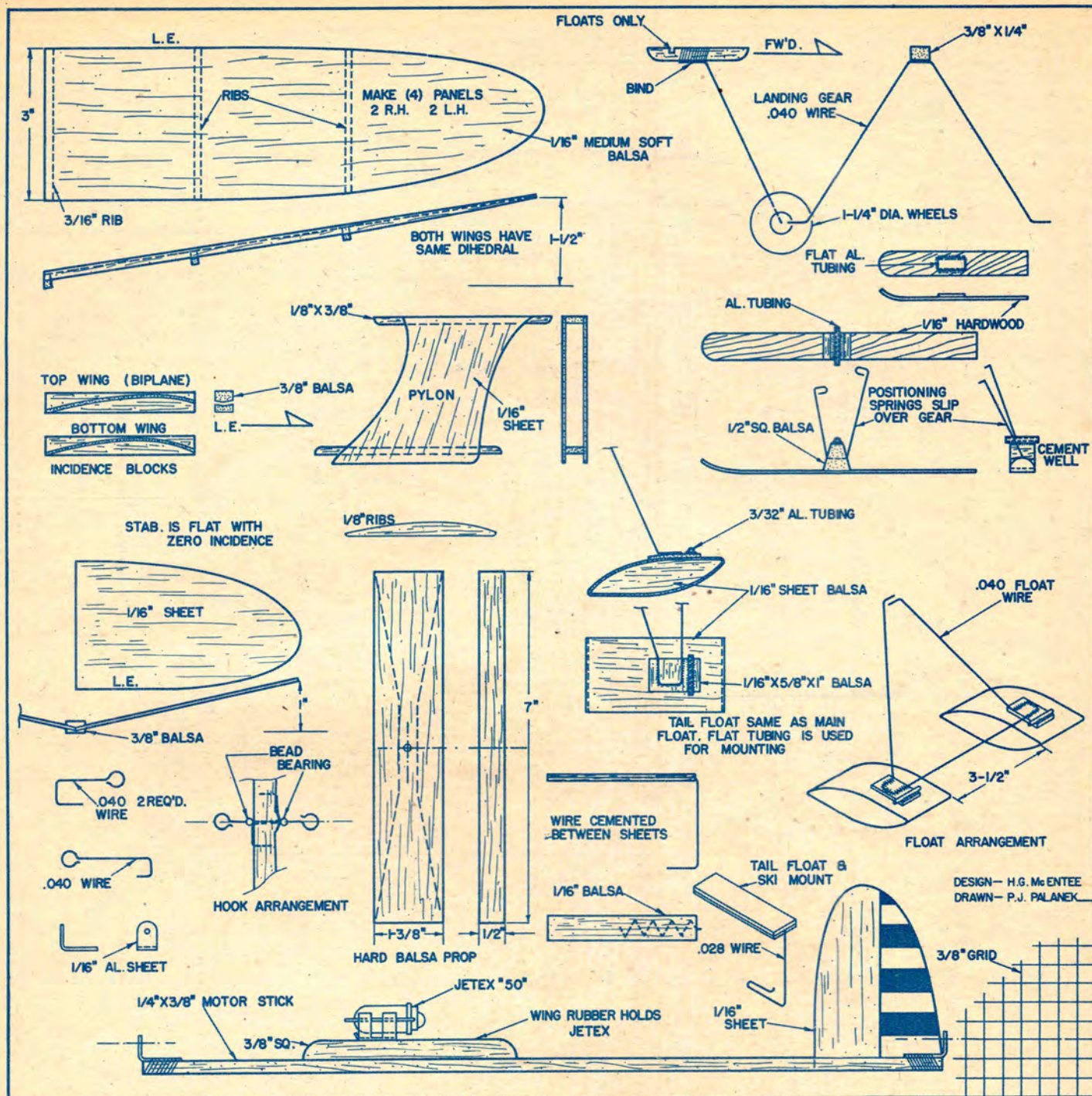
High wing mono (above) on floats. Delanne-type fitted with skis.



Biplane R.O.G. (above) set-up.



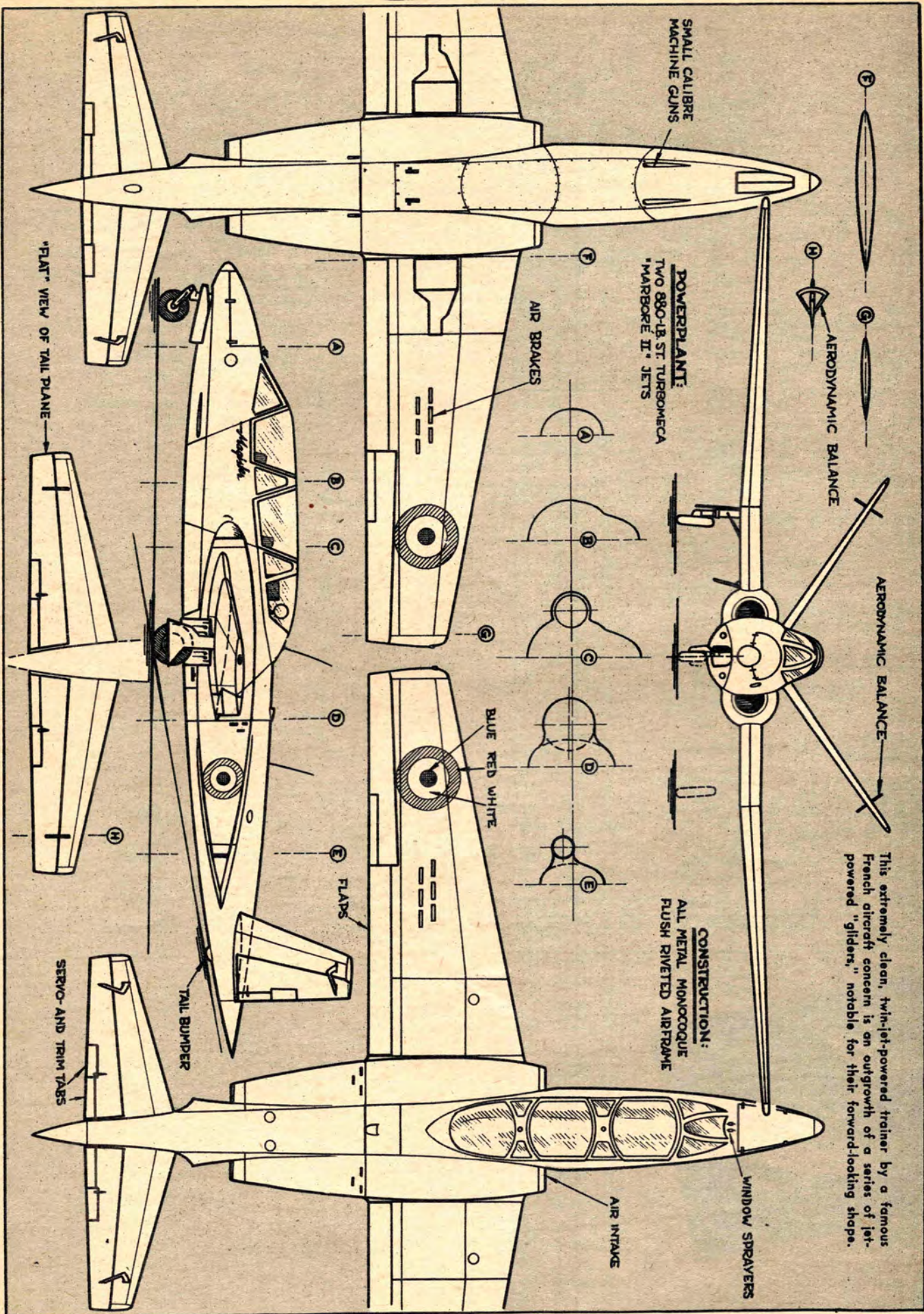
Tandem tractor (right) version.



Pusher (above) will surprise the tyro who has never flown this type. Follow chart (rt.)

Set-Up	Main Wing Location	Main Wing Incidence	Small Wing Location	Small Wing Incidence	Power (Strands)	Comments
Pusher	Over rudder, rudder down	Zero	4" back of nose	Leading edge 1/4" higher	(4) 1/8" flat T-56	No L.G. used Prop at rear
Normal Tractor	5" back of nose	L.E. 3/16" high as made	Under rudder	Zero	(3) 3/16" flat T-56	L.G. at nose for weight
Biplane	Wings below and atop pylon Pylon 5" from nose	Top, L. E. 3/16" high Lower—Zero	Under rudder	Zero	(5) 1/8" flat T-56	L.G. at nose for weight
Pylon Mono	Pylon 4" back from nose	L.E. 3/16" high	Under rudder	T.E. 1/4" low	(3) 3/16" T-56	L.G. at nose for weight
Delanne	Upper wing on pylon 4" from nose Lower wing to rear of pylon	Both wings same as biplane	Remove		(3) 3/16" T-56	L.G. at nose for weight No stab used
Tandem	2 1/2" from nose Second wing at 0 deg. 9" from nose	As made	Remove		(3) 3/16" T-56	L.G. for weight No stab used

This extremely clean, twin-jet-powered trainer by a famous French aircraft concern is an outgrowth of a series of jet-powered "gliders," notable for their forward-looking shape.



Magic Celastic—the Fantastic Plastic

You won't believe it until you see it! Even then you'll be amazed at this marvelous material

By AUBREY KOCHMAN

■ The era of super-plastics is here . . . plastics that can be formed at home without elaborate equipment! And the July issue of "AT" introduced a form of plastics using rags and Weldwood glue to form the Porsche automobile body. But this method, although quite successful, results in a very hard shell that requires the use of a lot of muscle or some form of power equipment to grind away excess material and smooth the surface for the final finishing.

Now, however, still another plastic, much simpler to use and quite inexpensive is available. We want to introduce you to "Celastic," a colloid-treated fabric and the trademark of the Celastic Corp. It is distributed in the U.S.A. and Canada by Ben Walters Inc., 156 Seventh Ave., New York, N. Y. Celastic comes in thin, medium and heavy weight. It can be hand shaped, draped, moulded, cast or embossed. Its use in model railroading has been highly successful in the building up of such scenic effects as mountains and tunnels.

The potential use of Celastic in model airplanes is practically unlimited. Where rigidity is important it should be "framed" adequately. Although flexible, it retains its shape and can take quite a beating without cracking, tearing or splitting. It is light in weight and weatherproof. It is also a self-adhesive. To quote the manufacturer, "Celastic is one of the most powerful adhesive agents ever discovered and will exert a vise-like grip on any clean dry surface. Celastic bonds metal to metal, wood to wood, plaster to plaster—or any combination of materials."

Experimenting with Celastic has shown that it is ideal for moulding wheel pants, cheek cowl, ring cowl and helmet cowl. Small rubber model propellers can be easily hand formed. Landing gear strut fairings are a snap to form by simply folding Celastic around the wire, gear. A narrow strip when wrapped around the axle makes ideal wheel collars. For rubber jobs or Half-A models, it is a simple and efficient means of attaching landing gears to either balsa or plywood mounts. Thin all-balsa wings, pylons and tail surfaces covered with Celastic are practically indestructible.

(In other than the model airplane field, it has proven the perfect medium for making such things as store window mannequins, masks and many stage props.)

To hand form Celastic you cut it to pattern shape and dip it into a Celastic Softener solution for about five seconds. Lay it flat and allow to set, lifting it occasionally

to prevent its sticking to the working surface. In about fifteen minutes it becomes smooth and leathery to the touch and is no longer sticky. It may then be stretched, twisted, rolled or made into any form and will hold shape without sagging. If it becomes too dry to work, you just brush on some softener and continue working.

In order to cast Celastic, some sort of male mould is necessary. For a great many model details, common everyday household items will make highly usable moulds. As an example, glass jars, water tumblers and wine glasses are perfect for full NACA type cowls; teaspoons or tablespoons for cowl vents or blisters.

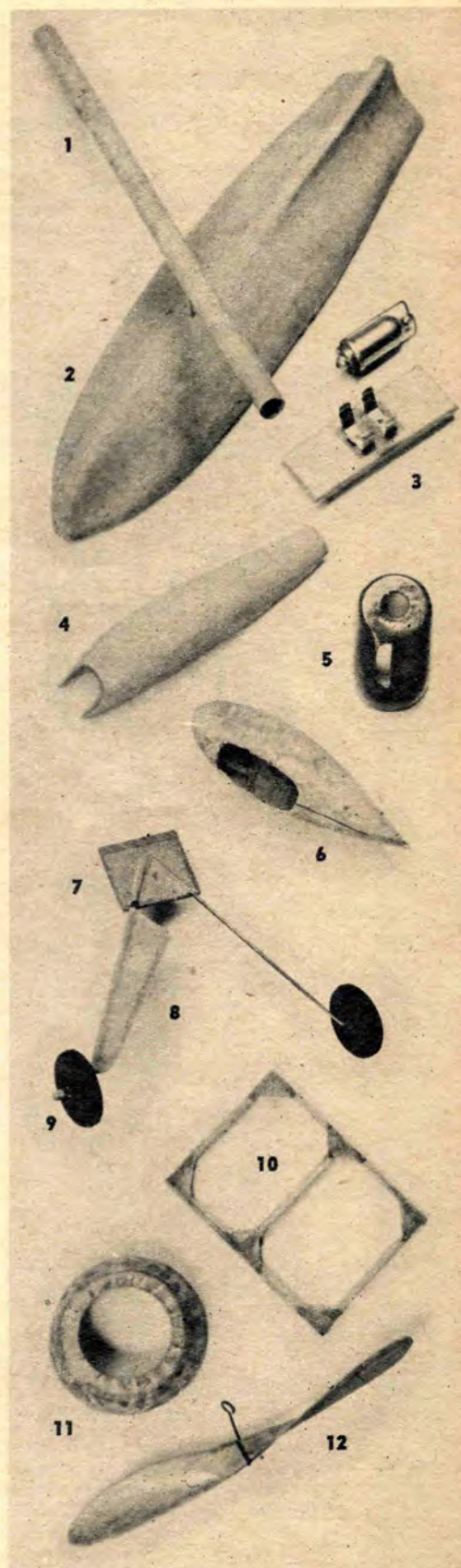
Soft balsa is perhaps the easiest type mould to carve if a readily available one is not handy. To cast over the mould, brush some Celastic Parting Agent onto the mould to prevent the Celastic from sticking to it. As an extra precaution and especially if the mould is either painted, shellacked or waxed, you cover it with thin aluminum foil after applying the parting agent.

Whenever possible apply the wet Celastic in one piece to avoid heavy sanding later. If the mould is very deep or of a shape that makes it necessary to use small pieces, tear the Celastic into strips before dipping into the softener. The torn feathered edges will be much easier to sand down. For greater strength, two or even three layers may be applied. However, for average-size parts one layer is usually sufficient.

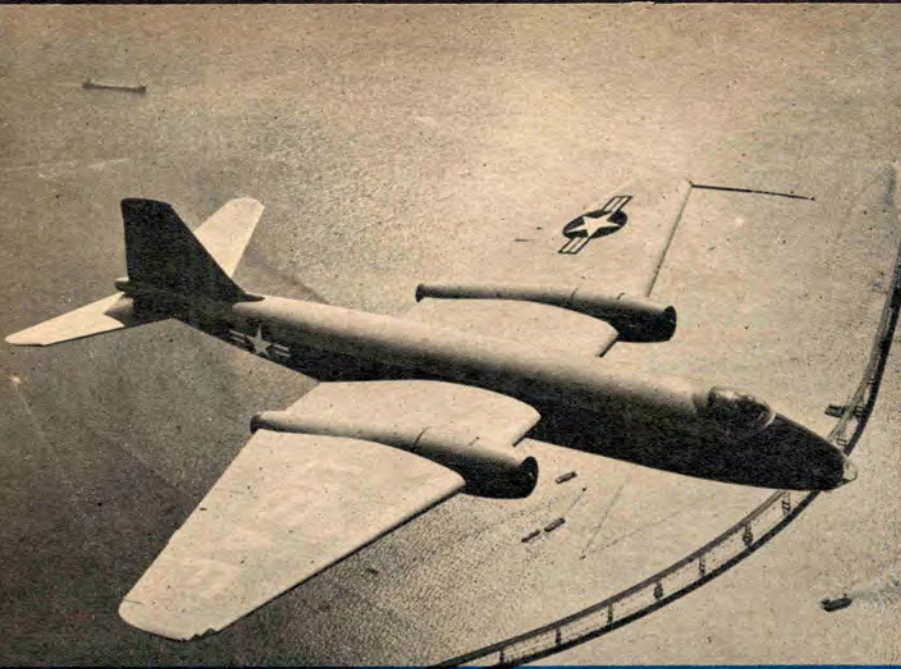
The casting should remain on the mould from one-half hour to two hours depending on weather conditions and the number of layers applied. When completely dry, the cast may be sanded smooth. For a real slick finish, apply a filler before painting. Bear in mind that Celastic has an acetate base, therefore any acetate base filler or dope will tend to soften it. This softening can be eliminated by brushing on one or two coats of shellac before applying the filler and colored dope.

If used wisely, Celastic can extend the life of any model by greatly increasing its strength-to-weight ratio.

If you're having any trouble with the "little woman" or the gal friend complaining about your spending too much time on models, a few fancy items whipped up out of Celastic should keep her quiet for awhile. If you're the artistic type you can turn out flowers, animal heads, plaques, futuristic fish—or what have you. Better still, get her going on it, then she'll leave you alone.



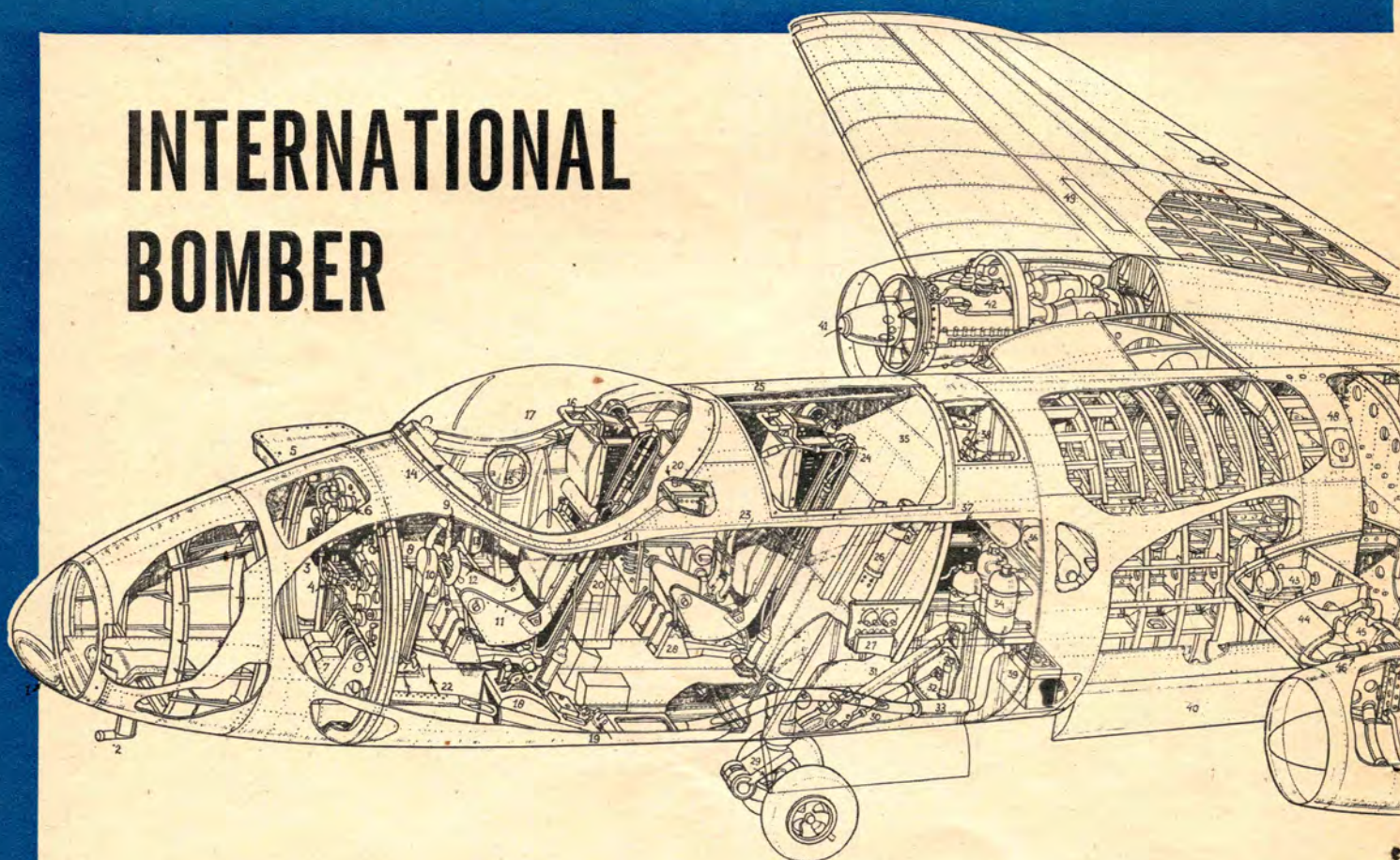
A few of Celastic's possibilities: 1) hollow, lightweight tube for masts; 2) almost weightless boat hull moulded over balsa carving; 3) Jetex clips held in place with Celastic; 4) Goodyear-Continental type racer cheek cowl; 5) Ryan cowl (looking from front, below); 6) wheel "spats"—commonly known as pants—moulded over tablespoon; 7) landing gear held against bulkhead; 8) l.g. strut fairing; 9) wheel collar; 10) Celastic gussets; 11) NACA cowl (head on); 12) prop.



AMERICAN B-57A

It is rare for U. S. military services to buy a foreign product, but the excellent characteristics of Britain's first jet bomber were sufficiently impressive to induce the USAF to purchase a number for night intrusion purposes. The airplane now in production by the Glenn L. Martin Co., of Baltimore is built under license granted by the English Electric Co. The American Air Force's version is designated the B-57A. The Yankee-built Canberras, powered by the big Wright J-67 Sapphire instead of the Rolls-Royce Avon as in the British original, feature two fixed forward firing guns. One of the two sample Canberras delivered to Martin crossed the Atlantic in 4 hrs. 18 min. Top speed is over 500 mph.

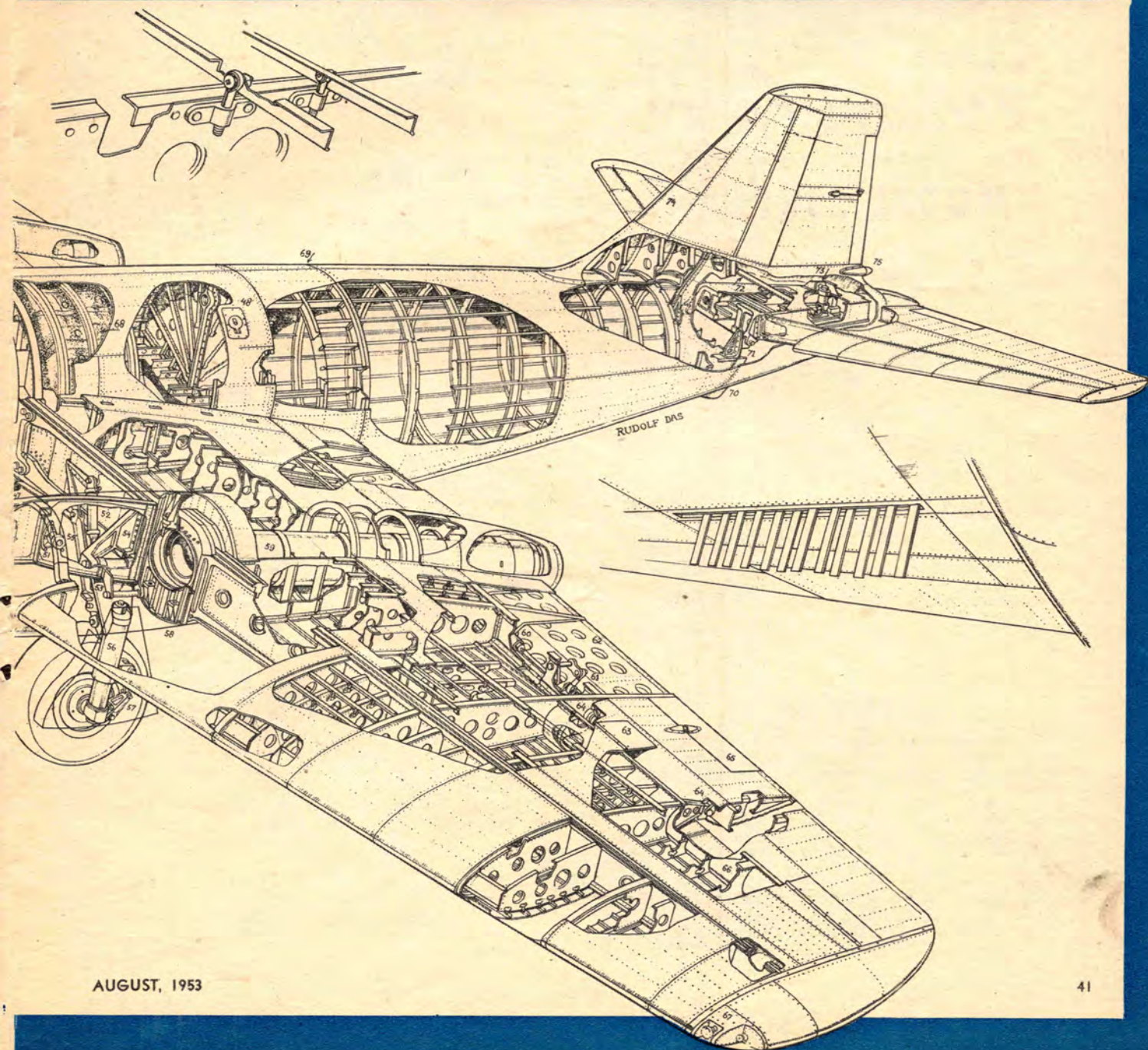
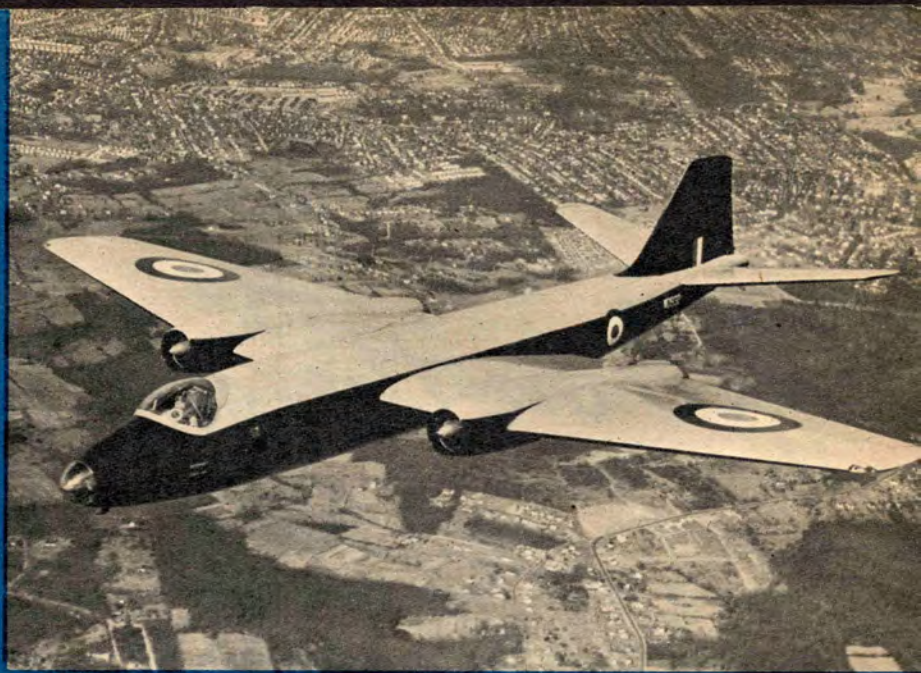
INTERNATIONAL BOMBER



1. Flat bomb aimer's window. 2. Bombsight. 3. V.H.F. radio control box. 4. Main switches. 5. Entrance door. 6. Flight instruments. 7. Rudder pedals. 8. First-aid box. 9. Ground fire-fighting access. 10. Control column. 11. Pilot's ejection seat. 12. Seat adjusting lever. 13. Fire extinguisher. 14. Emergency windshield. 15. Direct-vision window. 16. Ejection seat firing trigger. 17. One-piece jettisonable hood. 18. Power control. 19. Electric switches. 20. Radar. 21. Navigator's instrument panel. 22. Hot air supply. 23. Bomb aimer's ejection seat. 24. Headset leads. 25. Emergency escape hatch. 26. Navigator's ejection seat mounting. 27. Navigator's instruments. 28. Foot rests. 29. Nosewheel shock absorber. 30. Nose gear actuating jack. 31. Nosewheel retracting mechanism. 32. Nosewheel door operating jack. 33. Silencer. 34. Oxygen bottles. 35. Pressure bulkhead. 36. Air bottles pneumatic system. 37. V.H.F. radio and radar. 38. Main tank hydraulic system. 39. Battery. 40. Semi-retracted bomb doors. 41. Cartridge starter access. 42. Rolls-Royce Avon engine. 43. CO₂ bottle. 44. Air cooler of air conditioning system. 45. Heat-exchanger. 46. Generator. 47. Air compressor. 48. Fuel tank filler. 49. Air brakes. 50. Wing-fuselage pick-up. 51. Front engine mounting trunnion. 52. Main landing gear actuating jack. 53. Main landing gear leg. 54. Landing gear mounting. 55. Gear operating mechanism. 56. Shock absorber. 57. Torque scissor. 58. Firewall. 59. Jet-pipe. 60. Flapjack. 61. Flap actuating mechanism. 62. Split flap. 63. Hinged wing panel. 64. Aileron hinge. 65. Servo tab. 66. Aileron pressure seal. 67. Landing and navigation lights. 68. Flexible fuel tanks. 69. Fuselage split. 70. Tail bumper. 71. Tailplane mounting hinges. 72. Aft fuselage bracing. 73. Tailplane actuator. 74. Antennae in wooden fin leading-edge. 75. Navigation light.

BRITISH CANBERRA

Though little known, The English Electric Co., manufacturers of the Canberra, was organized back in 1918. During World War II the firm built a large number of Hampden and Halifax bombers under Handley Page license. The Canberra was EEC's first attempt at individual design and its own concept of a high-altitude bomber possessing the maneuverability of a fighter. This was achieved by virtue of the broad, low aspect ratio wing, clean design and plenty of power. Several countries are building or purchasing the bomber, including the U. S. A., Australia and Venezuela. It chalked up a number of impressive flights such as a 1-day round-trip crossing of Atlantic, and England to Australia in 22 hrs., 5 min.



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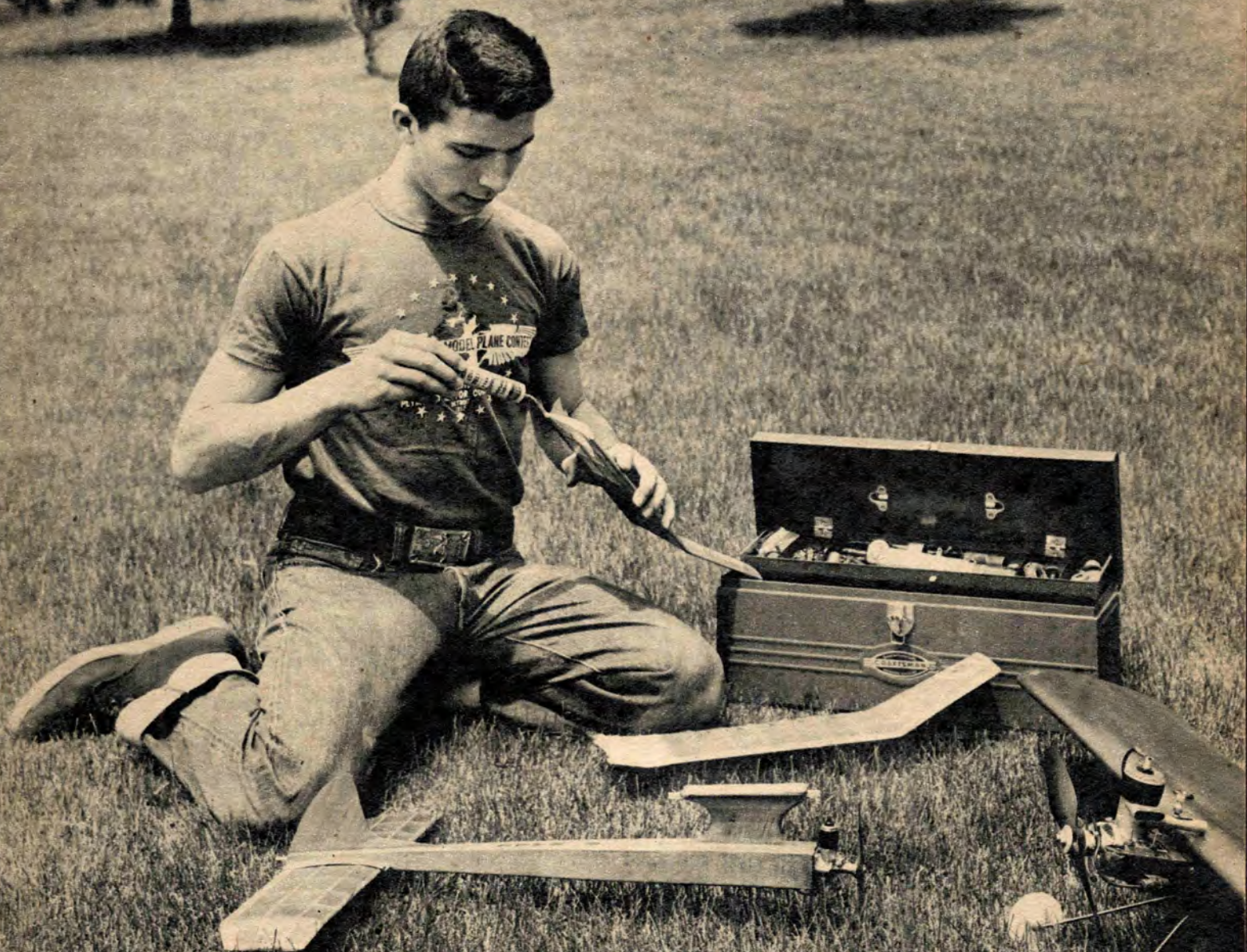
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TESTORS
DOPE

• **ROCKFORD, ILLINOIS**

Trixter Beam

Andrews' R/C Kit For Guillow Concern is Spacious

■ Designed expressly for R/C flight, the Beam has been under development for almost a year, during which time many configurations and several sizes of planes have been flown. The design finally selected works out to 50" span, with 372 sq. in. area, and is intended for use with .09 to .14 engines. The cabin area is exception-

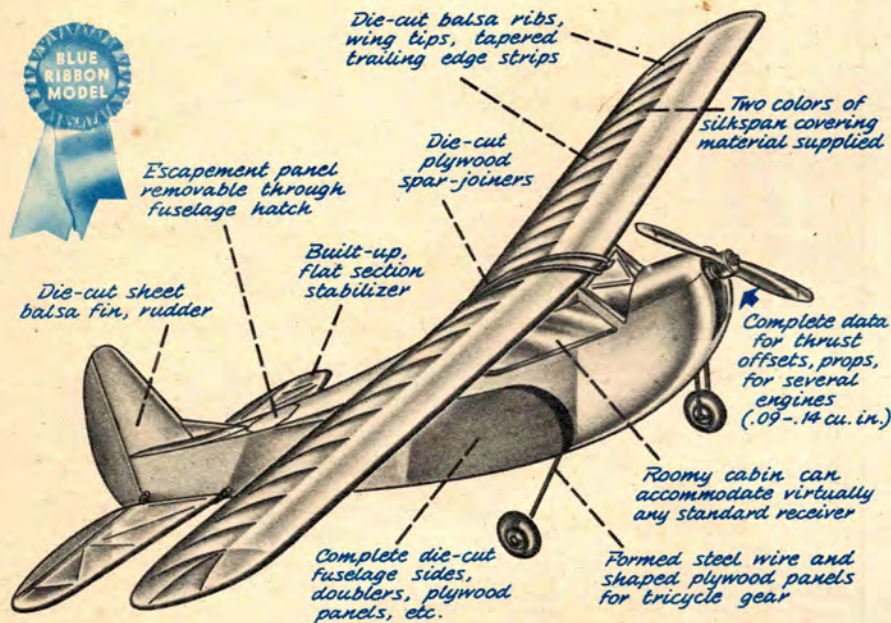
ally roomy, and will allow the builder to go in with both hands for installation and maintenance. Designed by Lou Andrews, the kit is produced by Paul Guillow (Wakefield, Mass.) and sells for \$6.95.

Fuselage is entirely of sheet balsa, and it is interesting to note that much use is made of hardwood in the nose area and

around the cabin, for strengthening purposes, with minimum bulk. The roomy fuselage is over 7" high at the cabin, and 3 3/4" wide inside. An inverted engine mounting is employed, and the plans show the installation of the Walker pressure tank fuel system. The trike gear wire parts are fully formed, and wheels 1 7/8" diameter are suggested. Wiring plans and installation details are given for the radio equipment (the Macnabb 465 is shown, but any may be used, of course); the escapement is mounted near the tail, with an ingenious fully enclosed linkage to the rudder.

A flat-bottomed airfoil is utilized for the wing, which has three spars, in addition to the leading and trailing edges; the leading edge is sheeted on the top, and tips are built up of sheet balsa. A flat symmetrical stab is employed. It is detachable, but the rudder and fin are permanently attached to the fuselage. The elevators are of sheet balsa, and though they are shown cemented permanently to the stab, they could easily be separated and made movable, should the builder wish to try elevator control.

The plans are very complete; both halves of the wing are given full size, so both may be built at once. There are many assembly sketches and ample building and finishing instructions. Clear sheet material is furnished for the cabin windows, and the kit includes two colors of tissue for covering purposes. The directions suggest that the all-balsa fuselage be tissue-covered. Wood in the kit has been well selected for its intended purpose.



JASCO Control Job

Free Flight Firm Launches U-control Racer

■ Speedee is a sleek little low-winger on the Goodyear and Continental Racer pattern, intended for Half-A team racing or just plain fun-flying. Produced by Junior Aeronautical Supply Co. (New York, N. Y.) the kit sells for \$1.85. The model is all of balsa construction, except for the turtledeck back of the cockpit, where

stringers are applied, and covered with tissue. It is intended for use with the smaller engines—from .035 to .049 cu. in. It has a 17 1/2" span, and due to the selected grade of balsa used, should turn out to be a light and responsive little racer.

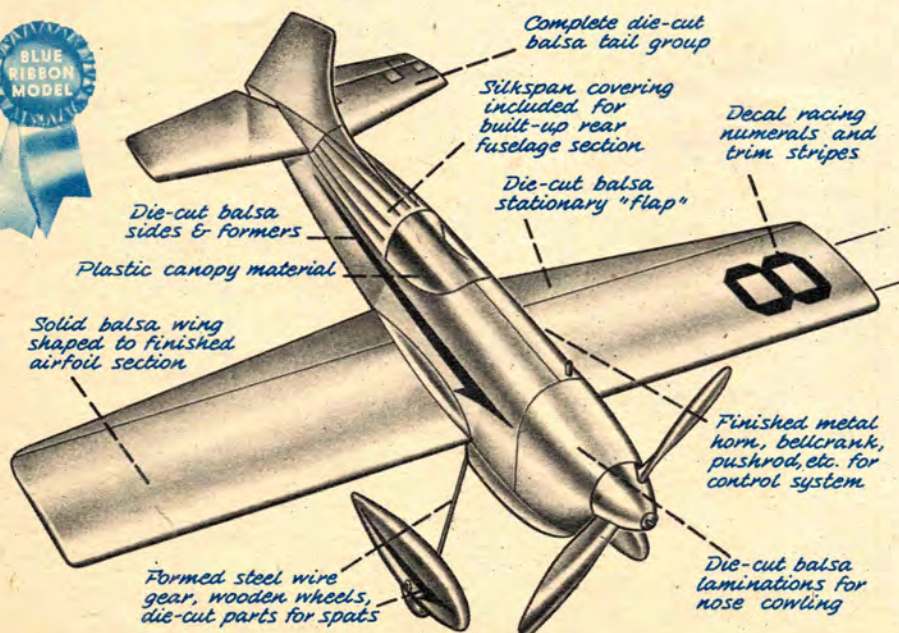
The fuselage has the simple and light sheet side and former type of construction;

bottom covering is also sheet, and this material is used for the cowling forward of the cockpit. The firewall is die-cut three-ply hardwood, and another piece of this ply holds the landing gear. The motor is mounted inverted, and over it is a built-up balsa cowl of novel construction; it is formed of eight U-shaped pieces of die-cut balsa, which are cemented together, then cut to the proper overall shape. The engine is practically invisible when you have finished, though there is plenty of air around it for cooling and exhaust.

Landing gear is single leg style, with the wire completely bent to shape. A neat method of assuring strong attachment of the wheel pants is found in this kit; stamped pieces of brass are to be soldered to each l.g. leg, these pieces offering a good cementing surface for pant attachment. Wheels are turned hardwood 1" dia.

The wing is a single piece of semi-finished balsa, shaped on the upper side for the correct cross section. "Stationary flaps" are added to the trailing edge, and give a taper shape to the finished wing. Tail surfaces are sheet balsa, elevator hinges being of cloth. Bellcrank, horn and pushrod are completely finished and ready for use. The crank mounts under the wing, and the control system is open.

As usual with many small prefab models, no full-size 3-view plans are shown, but the plan sheet has large detail views of various assembly steps, plus a photo of the finished model. The kit includes decal sheets of numerals and decorative strips, and windshield material.



Jetex Voodoo

American Telasco Offers Unique Formed Balsa Fuselage

■ One of the first things you note as you open the box holding this kit is a pair of moulded fuselage sides, apparently made of very thin balsa (much less than 1/32" thick), yet surprisingly sturdy since they have had a sheet of model tissue cemented on the inside, during the forming process. The kit is for the McDonnell "penetration fighter," which is said to have a top speed over 700 mph. Intended to be flown with a Jetex 50 engine, this is a close copy of the big ship; about the only main deviation from true scale is the attachment of the jet unit in a trough under the wing, rather than entirely inside the fuselage. This makes it much easier to load the Jetex, and obviates the possibility of damage from flying sparks.

A product of American Telasco Limited (Huntington, N. Y.), the kit will sell for \$1.25.

Before you use those moulded sides, a framework of sheet balsa is first built up. All necessary parts are in the die-cut sheets of 3/32" stock. There is a full length keel piece, to which the swept-back rudder is affixed. Then come two formers, and various parts to produce a strong wing mount and the channel into which the jet mounting clip fastens. The nose shape is assured by carved balsa blocks, which strengthen this section to take the inevitable hard knocks that the plane must withstand during flying.

All the internal frame parts of the fuselage, and the wings as well, are slotted and notched so that it's mighty hard to go wrong in the assembly. The 13" span sheet

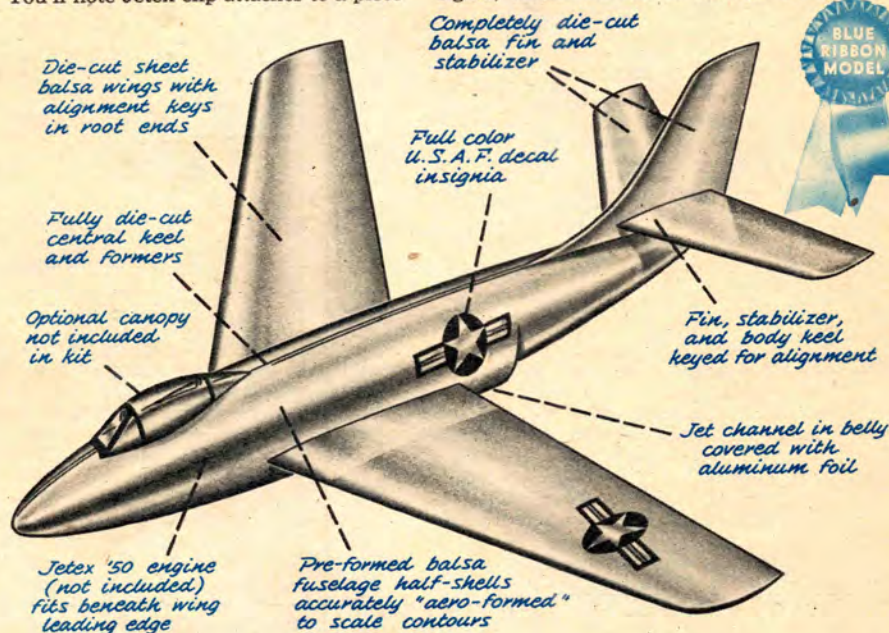
balsa wings go on, then come those sleek moulded shells. Since this is to be a flying model, no landing gear is included in the kit, and it is not advisable to fit one.

The stab is a single piece of 3/32" sheet, die-cut of course, which fits in a slot in the rudder.

You'll note Jetex clip attaches to a piece

of hardwood; the unit is half hidden by the fuselage trough when it is in place. Thus the scale appearance of the model is preserved.

The plans consist entirely of exploded views and assembly sketches, along with instructions. Kit includes decal AF insignia, aluminum foil to line jet trough.



Hail the Hawk

Scientific's P6-E is Famous Biplane Pursuit

■ Though the manufacturer does not claim that this kit is exact scale, it looks very close indeed. All the features of one of the last biplane fighter planes are faithfully reproduced; you get the wheel pants, radiators under the fuselage, the N-struts between wings, etc. Produced by Scientific Model Airplane Co. (Newark, N. J.), the kit sells for \$2.95, as does the companion kit for the Navy F4B-4 biplane.

Though the model is only a stubby 11" long, the span is 17 1/2". Both wings are tapered, as they were in the big ship; the wings are carved to cross section, and the tips rounded off. You simply cement on additional sheet balsa trailing edge strips to get the taper effect.

The fuselage is carved to outside shape, and the forward section is hollowed out for the fuel tank. The engine is to be mounted on the ply firewall, and is inverted, thus adding to the realism of the model. The makers furnish a stamped aluminum cowl to go over the engine, the cowl being left open at the bottom for exit of exhaust gas and dripping fuel. The shaped landing gear wire is clamped to the front of the firewall by the rear of the engine crankcase. Wheels are of rubber with eyelets to assure smooth turning on the axle, and the pants are built up of layers of die-cut sheet balsa. You also get a tiny workable tail wheel.

Die-cut three-ply is used for the N-type interplane struts, and these should be rugged enough to stand many a hard landing.

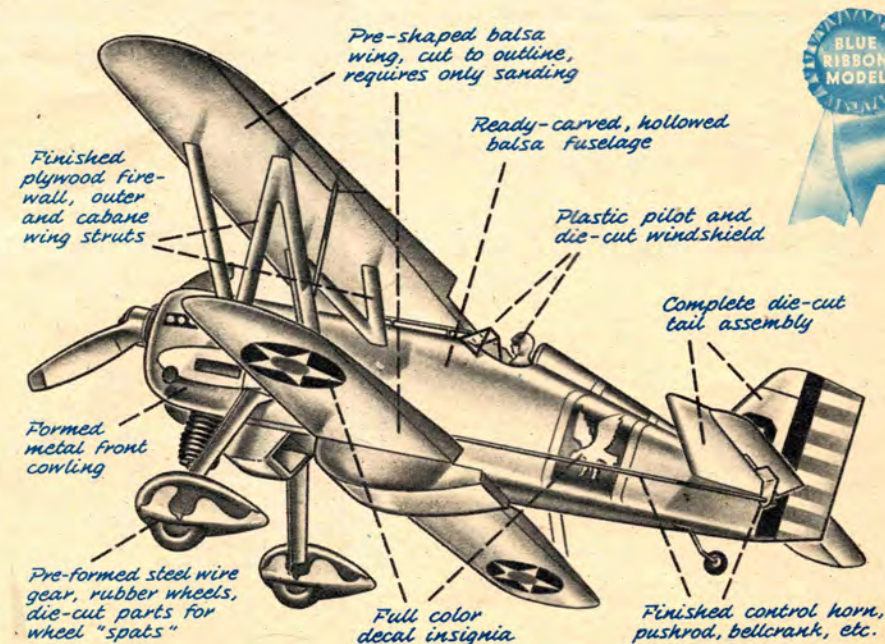
Tail surfaces are of 1/16" sheet balsa; the fuselage block is slotted to hold the

stab, while the two sheet elevators are assembled with a hardwood dowel, and hinged with cloth. All control parts are furnished, including aluminum bellcrank and horn, and bent pushrod.

The plan shows a full-size view of the model, with all details of the model decoration. Very realistic appearance of the

Hawk is assured by the inclusion in the kit of a most complete sheet of decals, as well as a printed plastic windshield and a plastic dummy pilot. The kit is intended for engines from .020 to .074, and should weigh around 5 oz. when finished.

This brings to nine the number of SMAC's scale and semi-scale kits.



MOTOR OF THE MONTH

Cox Thermal Hopper

An engine to delight the heart of any free flight fan; the reed type intake valve's really unique

■ The Space Bug .049 engine by L. M. Cox Mfg. Co. caused quite a stir in the model world with its amazing power. Now comes the Thermal Hopper fitted with a special "Multi-jet Carburetor" for steady power under varying flight conditions. Modelers who want to use a fuel shut-off, special stunt tank or other fuel arrangements will find the Thermal Hopper eminently suitable.

Many new features have been incorporated in the Multi-jet Carburetor. The venturi throat is machined to a good finish with correct angles and radii for peak efficiency. Fuel enters the venturi through three equally spaced holes at the smallest diameter. A groove in the outer surface of the venturi tube distributes fuel to the three jets. The needle valve assembly slides over the distribution groove and is held in place by a retainer nut and screen. The combination of three jets and efficient venturi gives more even fuel feed, excellent atomizing. The fuel suction test shows 12½" which is very good for a Half-A engine.

All parts except the fuel tank and carburetor are interchangeable on the Space Bug and Thermal Hopper. A reed type intake valve is the most outstanding feature. This consists of an .0015" thick shim brass reed against the valve seat backed up with a .004" thick reed. A back plate limits how far the reeds open so they will not bend enough to crack. The reeds and

back plate are held on the carburetor assembly by the "reed housing." The glow plug is built into the cylinder head to get a smooth dome in the combustion chamber.

This unit can be purchased at the average price of glow plugs if the element should burn out. The cylinder and fins are machined from one piece of steel and lapped to fit the piston. Slots milled inside the cylinder act as the fuel bypass and intake port. Two large exhaust ports are milled in the sides of the cylinder. The steel piston is hardened and ground to an excellent finish.

A ball and socket type aluminum connecting rod is held in the piston with a steel retainer plate and snap ring. The crankshaft is quite small in diameter, since it does not carry a rotary valve and the center section is undercut to reduce oil drag. Hardened steel is used with bearing surfaces ground. The base is a high-pressure aluminum die-casting with a bronze bushing for the crankshaft. Clearance for the crankshaft and connecting rod is machined to a close fit to give high-base compression.

The needle valve was placed above the carburetor for the engine test so it would be above the tank and reduce flooding. This gave much better results in starting than the built-in tank. In general, starting was best with the needle valve open one-half turn from running position and a

heavy prime. When a light prime is used the engine has more tendency to start backwards. The Thermal Hopper was fitted free enough to start easily on the first run.

Continued running produced a gain of approximately 100 rpm. The needle valve adjustment was broad at all speeds from 10,000 rpm to 19,500 rpm, and the engine ran steady throughout the full range. There was very little vibration at any speed. The generous radial mounting surface close to the cylinder gives the Thermal Hopper a rigid mount.

Thimble Drome Racing Fuel was not available at the time of the test, but would probably give even higher rpm than shown in the performance figures!

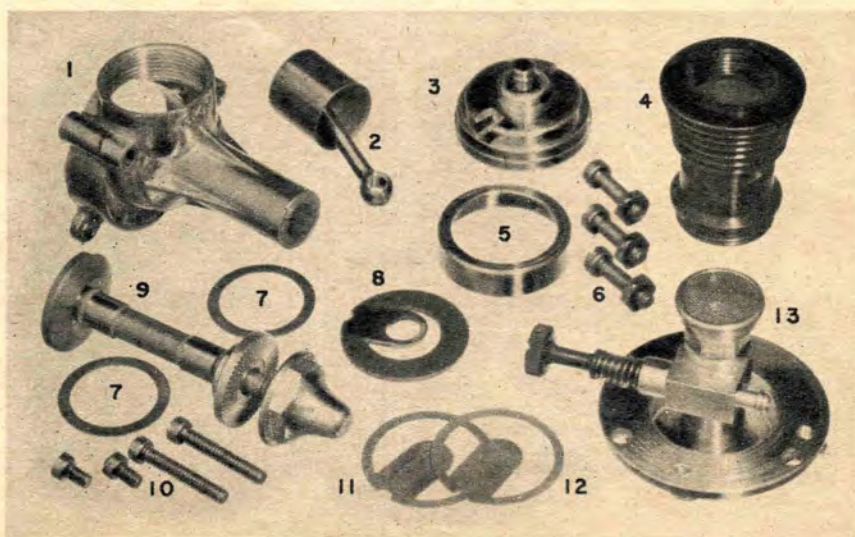
Engine Data

Performance. Weight: 1.39 oz. Propellers: 7/4 wide blade, 10,500 rpm. 6/4 wide blade, 13,000 rpm. 6/3, 15,200 rpm. 5/3, 19,500 rpm. Fuel: Thimble Drome. Fuel level test: 12½" at 15,200 rpm.

Design Data. Displacement: .049 cu. in. Class: Half-A. Stroke: .386 in. Bore: .406 in. Stroke bore ratio: .95. Compression ratio head: 6.5. Compression ratio base: 1.41. Port area intake: .0087 sq. in. Bypass: .0098 sq. in. Exhaust: .070 sq. in. Ignition: Built in glow plug.

Construction Features. Multi-jet carburetor gives more power and steady feed. Reed valve intake. Low friction design.

1. Crankcase: die-cast aluminum, .22 oz.
2. Piston: steel-hardened and ground, .407" dia. x .400" long; connecting rod: aluminum, ¾" long, .10 oz.
3. Cylinder head and glow plug: aluminum, ¾" dia., .14 oz.
4. Cylinder: steel, .406" bore x 15/16" long, .40 oz.
5. Reed housing: aluminum, 23/32" dia., .02 oz.
6. Mounting bolts: steel, 3-48 N.C., .08 oz.
7. Cylinder head gasket: copper, .010" thick
8. Reed back plate: aluminum, .032" thick, .02 oz.
9. Crankshaft: steel-hardened and ground, .187" dia. shaft, .109" dia. crankpin, .18 oz.; drive washer: aluminum, 1/2" dia., .03 oz.; propeller nut: aluminum, 5-40 N.C. thread, .02 oz.
10. Back cover bolts: steel, 2-56 N.C., .04 oz.
11. Reed valve front: spring brass, .004" thick.
12. Reed valve rear: .0015" thick, .24 oz.
13. Back cover plate and carburetor assembly: aluminum, 1 1/8" dia.



NEW EASY TO BUILD

F-51 MUSTANG MINIATURE SCALE CONTROLINE!

The famous F-51 Mustang fighter is the first in a series of new great "EASY TO BUILD" miniature scale control line models. Fellow — you have never seen anything like these models. Each kit is loaded with prefabricated, and fully finished balsa and plastic parts that will enable you to build and really fly the most beautiful scale control line models you have ever seen . . . and it really flies!

MUSTANG FEATURES:

- completely prefabricated all parts razor cut to shape
- lightweight, NO UNNECESSARY solid balsa parts
- redi-formed landing gear, rubber wheels, complete hardware
- velvet smoothed shaped one piece wing
- large colored decals
- Step by step plans and instructions



PLASTIC PARTS

SPINNER
PILOT
CANOPY
COWLING

AMAZINGLY
PRICED

\$1.95

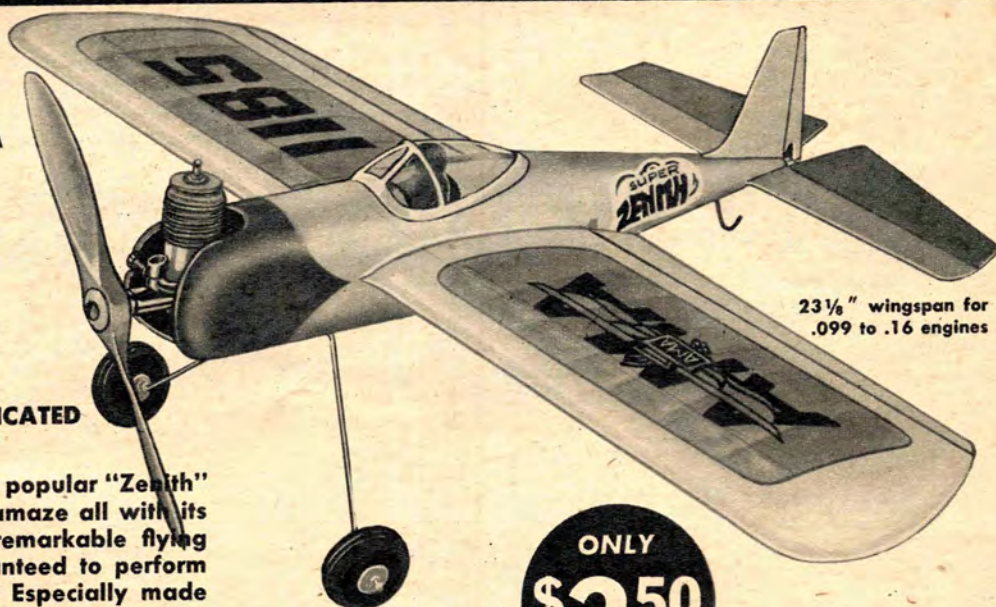
ANOTHER REGULAR
ENTERPRISE KIT FOR

TOP CLASS A STUNTING

SUPER ZENITH

A COMPLETELY PRE-FABRICATED
FULL STUNT MODEL

A new, larger version of the popular "Zenith" this great new model will amaze all with its ease of construction and remarkable flying and stunting ability. Guaranteed to perform the complete stunt pattern. Especially made for the new O.K. .14 and K&B .15 engines.



ONLY

\$3.50

FEATURES:

- fully shaped 2 piece fuselage
- completely prefabricated high lift stunt wing with flaps
- beautiful large formed plastic canopy
- redi-formed landing gear, rubber wheels, complete hardware

see the complete famous enterprise line at your dealer today

CONTROLINE • FREE FLIGHT • SOLID SCALE • GLIDERS

ENTERPRISE MODEL AIRCRAFT CO., INC.
Dept. 138 234 E. 2nd St., Mineola, N. Y.

GUILLOW'S

Radio controlled model **Trixter BEAM**

the newest star in the R/C field

FOR BOTH 465MC AND 27.255MC
"Examination Free" FREQUENCIES

SPECIFICATIONS

Wing Span 50.25"
Wing Chord 8.25"
Effective Area 372"
Body Length 35.25"
Flying Weight 36.5 oz.
Wing Loading 14-16 oz.
Power 09 to .14
Category Radio & Sport
Ability Contest & Trainer

Designed and tested by Lou Andrews

\$6.95

complete with full size plan sheet. Accurate die cut parts. Formed landing gears. Necessary hardware, two colors of covering, and celluloid for windows. Wheels, liquids, receiver, and motor unit not included.

A proven model that easily handles the full equipment of the MacNabb 465 receiver, Bonner compound escapement and motor control units. There is plenty of fuselage space for all radio gear, plus working room for your hands.

The Beam is tops in performance and stability. Designed to protect your investment in R/C equipment, yet you will be pleasantly surprised with its exceptionally graceful lines. See it at your local model store and be the first to fly this latest Lou Andrews design.

GUILLOW'S TRIXTER Control Line Stunt Models

GUILLOW'S Trixter PROFILES

CLASS A - B
Wing Span 32 in.
Engine 19 to .35 disp.
\$2.50

CLASS B - C
Wing Span 38 in.
Engine 29 to .35 disp.
\$3.50

Designed and tested by Lou Andrews - - -

GUILLOW'S BABY BARNSTORMER ½ A stunt model

Wing Span 23½ in.
Engine 035 to .049 disp.
\$2.95

GUILLOW'S National Champion BARNSTORMER

Wing Span 47 in.
Engine 23 to .35 disp.
\$5.95

GUILLOW'S PROFILE TRAINER

Wing Span 32 in.
Engine 19 to .29 disp.
\$3.50

Note: Engines and hardware not included in Trixter kits.

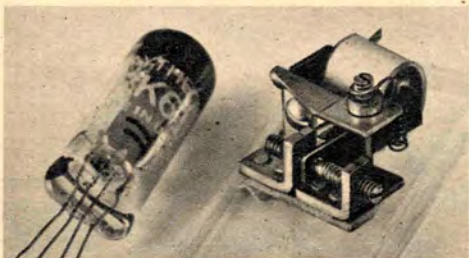
SEE YOUR LOCAL DEALER OR SEND DIRECT TO FACTORY, ADDING 25¢ TO ALL MAIL ORDERS
PAUL K. GUILLOW, WAKEFIELD, MASS.

Air Trails RADIO CONTROL MODELS

McENTEE ON R/C

■ Advanced R/C builders have often longed for a truly sensitive tiny relay; take a look at one made by G. L. De Haes. It is a midget on the lines of Sigma 4F, but weighs only $\frac{1}{2}$ oz. This particular one has a coil resistance of 4500 ohms, though he has made them up to 7000 ohms. He winds his own coils, and uses jeweled pivots! We found the relay shown would operate very nicely at 1 ma. (release at .6 ma.). All adjustments are by screws, and silver contacts are fitted.

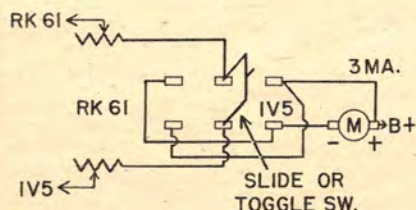
Mr. De Haes is a jeweler by trade; some of his friends have persuaded him to make them copies of this relay on a "custom-made" basis, and he has agreed to produce them for about twelve dollars. Address is 119 W. 1st St., Irving, Texas. Relay shown will work reliably at lower current



settings than any relay of anywhere near this weight that we have tested. Mr. De Haes says most of the R/C flyers around Dallas and Fort Worth fly originals; one of these is a low winger, with R/C equipment inserted through the nose on a tray, like the old Zippers. Receiver of this ship is two-tube along lines of C.R. design, but has Raytheon CK 503 in second position. Practically all the flyers are installing compound escapements, to get an easy way of adding motor or elevator control.

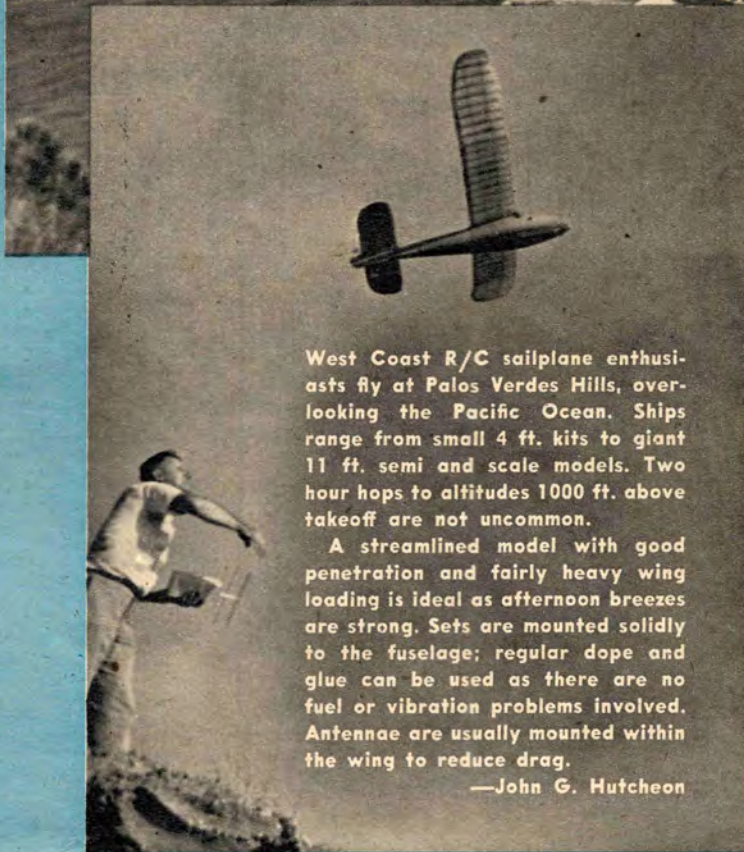
Big news as this was written was high-speed flight made by ship of Bill MacKerracher (San Francisco Mustangs). He has worked for some two years and finally perfected McCoy .60 with integral dual counter-rotating props. Plane itself has span of 5 ft. symmetrical airfoil on the tapered wing; both wing and stab are set at zero degrees. Ship weighed 9 lbs., carried a pound of fuel! With tank empty, wing loading is 45 oz. Top of wing is flat (no dihedral). Ship is equipped with Rockwood 5-channel reed system. The flight was started ROG, and even though engine was running rich, estimates of speed ranged from 50 to 100 mph!

Bill, with not much pilot experience, had persuaded Alex ('52 Nats winner) Schneider to take the controls. Alex did a fine job, brought the speedster down to a nice landing after a flight of about three minutes; said he had to lift ship off the runway with the elevators, used up elevator during most of the flight. Flight brought fame and vindication to Bill, red faces to many of his Mustang club members (Continued on page 79)



AUGUST, 1953

SLOPE SOARING IS FUN!

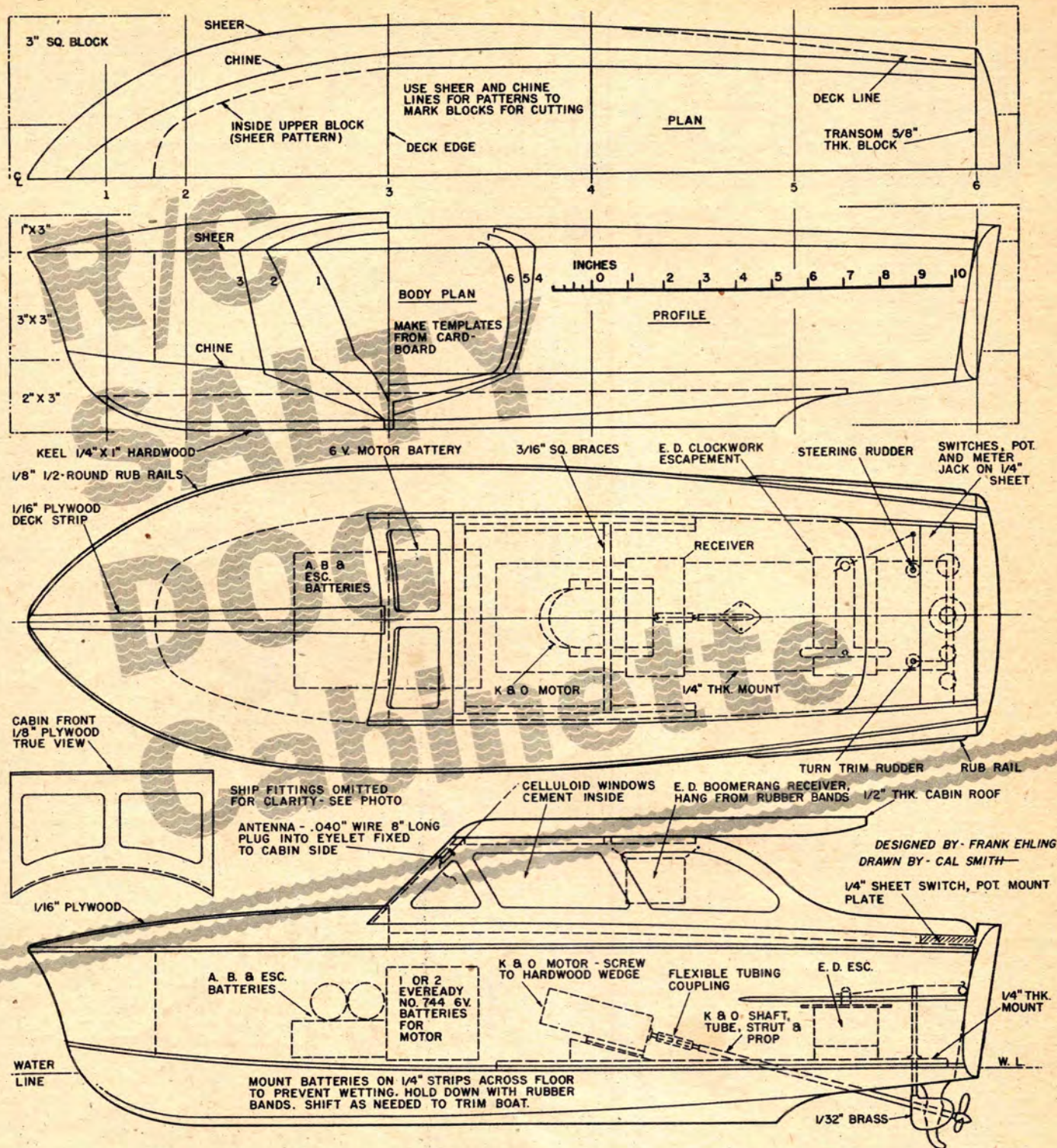


West Coast R/C sailplane enthusiasts fly at Palos Verdes Hills, overlooking the Pacific Ocean. Ships range from small 4 ft. kits to giant 11 ft. semi and scale models. Two hour hops to altitudes 1000 ft. above takeoff are not uncommon.

A streamlined model with good penetration and fairly heavy wing loading is ideal as afternoon breezes are strong. Sets are mounted solidly to the fuselage; regular dope and glue can be used as there are no fuel or vibration problems involved. Antennae are usually mounted within the wing to reduce drag.

—John G. Hutcheon





Well, folks, it had to happen. When versatile Frank turned to radio-controlled boats he came up with an extremely simple one!

By FRANK EHLING

■ With radio control still a challenge to most modelers, R/C boating means no fear of crashes, or lost equipment. With the flip of a switch you start or stop your motor. Yes, you can be a "gentleman" and operate in your Sunday attire!

With the aid of a band saw, your local cabinet maker or school's manual training instructor it's possible to have the balsa hull blocks cut to size (or Jasco can supply them) and in a short time you will be well on your way toward completing the hull. You can even hollow the hull on the band saw or if you have a large coping saw the job can be done by hand. With a little automobile filler, the pores of the wood can be made like metal and you

can come up with a super finish when adding your favorite color; we used white and green.

To start, obtain the balsa blocks. While the price may seem a little high, the hull should last indefinitely. If it hits a rock and dashes in the bow the seams won't let go. With the aid of Plastic Wood you will be back operating as if nothing ever happened.

Cement the six blocks together; these are best held together with rubber strands while the cement is drying. Weldwood works fine; follow instructions on the package. When dry the rubber strands are removed, and the faces of the blocks can be sanded smooth for drawing sawing guide lines. Trans-

HULL CONSTRUCTION

GLUE UP HULL BLOCKS OF 2"x3" & 3"x3"s USING WELDWOOD

② CUT KEEL SLOT 1/4" WIDE, 1" DEEP

③ CUT OUT PROFILE THEN CUT OFF BLOCK AT CHINE LINE

④ CUT OUT LOWER BLOCK AT CHINE OUTLINE

⑤ CUT OUT UPPER BLOCK INSIDE & AT SHEER OUTLINE

RUDDER DETAIL

SOLDER EYELET TO WIRE

NYLON WHEEL COLLAR

TO ESC.

1/8" I.D. & O.D. TUBING

SOLDER WASHER

EYELET

SOLDER RUDDER TO TUBE

1/2" BRASS L

1/16" THK. BOLT TO SIDES

1/4" THK.

4-5/8"

3"

7-3/8"

2-1/4"

2-1/2"

1/2" THK. HARDWOOD

1" THK.

SPONGE RUBBER

3-1/4"

1"x2"

15"

MAKE STAND FROM HARDWOOD

7"

1/2"

ALTERNATE ENGINE MOUNT FOR .099 CUB ASSEMBLY WITH SCREWS & GLUE

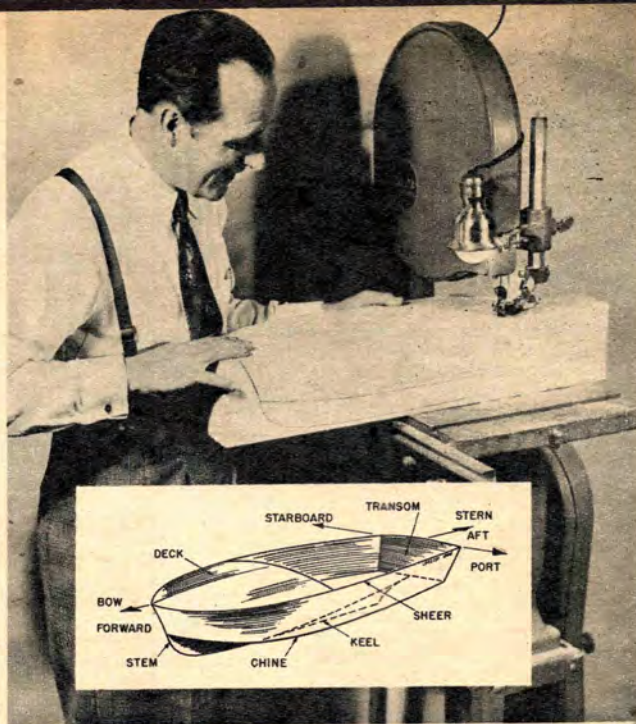
1/4" X 28 BOLT CEMENT TO TRANSOM ADJUST RUDDER TO EVEN TURNS

⑥ GLUE UP 1"x3" FOR DECK. CUT TO SHEER OUTLINE. GLUE UP LOWER & UPPER BLOCKS, DOPE INSIDE, THEN ADD DECK & TRANSOM - FINISH CARVE.

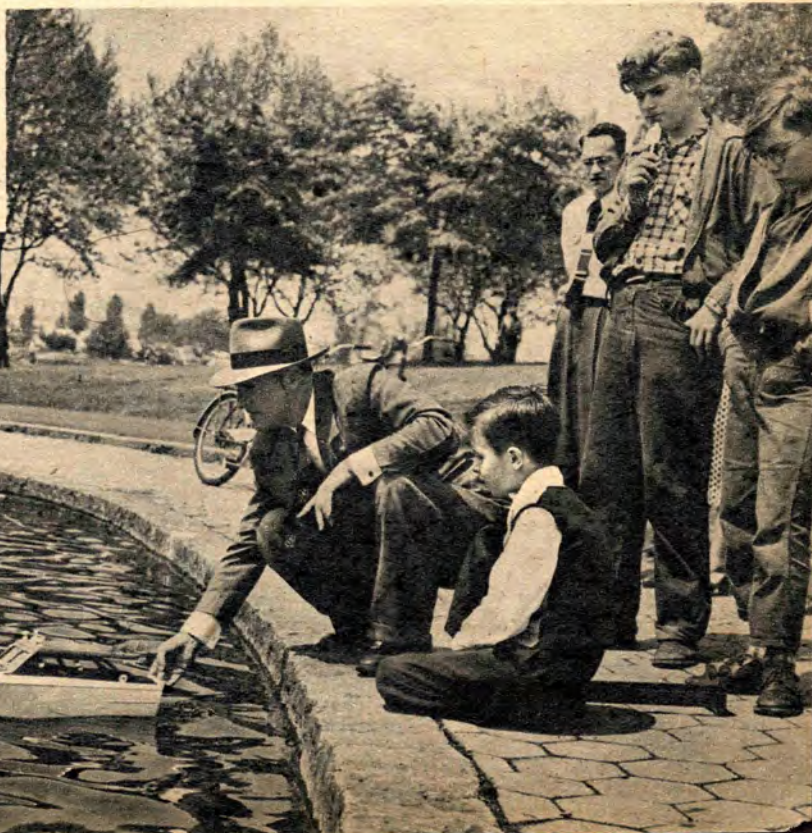
LEAVE BLOCK FLAT ON TOP, CARVE LATER WHEN DECK ADDED.

CABIN SIDE 1/8" PLYWD. MAKE 2

DECK LINE



Head-on shot of Salty Dog (above) indicates realistic lines of this ultra-simple little cabin cruiser. Put yourself in the picture—got your balsa blocks? Quick, ma, the saw—and away we go!



fer the outlines from the plan to the top and side of the block; this can be done with cardboard templates. The side view is cut to outline first. After these have been cut, tack cement together with quick-drying cement and cut the top view outside outline.

Then taking the lowermost block from the side view, remove the second part which was cut along the chine line. This piece is set aside for it is the bottom of the hull. Now cut the inner outline, being careful not to split the front section. If this splits, it can be recemented, using the bottom part which was removed as a guide. Upon completing the cutout it can be permanently cemented (Continued on page 58)

"AT" Data Dept:

Macnabb on R/C Design and Structures

Wing slots are occasionally seen and were used by Foxworthy in his winning Hoosier Hot Shot at the 1950 Nationals. There were reasons for them in this model. The angular difference between the thrust line of the motor and the wing was 20 deg. The wing was close to stalling. It was a beautifully flying ship, however, but when flown now (as it often still is after several hundred flights), its performance looks like an indoor model in comparison to some of the hot jobs currently being built. Conclusions are that wing slots are no longer of value.

Much less dihedral is needed in an R/C wing than a free flight if the wing is on the top of the fuselage. The weight of the radio and battery helps restore level flight after a turn. With less dihedral after neutralizing the rudder the ship tends to keep turning and recovers to level flight smoothly. A little practice may be required to neutralize the rudder before the turn is to be completed. Dihedral from 1 1/4" to 2" per foot has been found satisfactory and the larger value still looks like scale model design.

Stabilizer

There are two types of stabilizer: lifting, and non-lifting. Avoid the lifting stabilizer for R/C planes. A plane with a lifting stabilizer sometimes will not come out of a spiral dive, as attested by a basketful of crushed balsa. The non-lifting or symmetrical stabilizer allows a very easy method of trim for differences in C.G. location. The construction of a stabilizer should be



Fig. 19

self-evident, but Fig. 19 illustrates a rib with a hole for the strut. For stabilizers with less than 6" chord the rib may be omitted. Camber factor of .11 is average. Aspect ratio may be between 3 and 4.

Rudder

Your choice is single versus twin. You can't go wrong with twin rudders and they have some definite advantages, but proper design will allow equivalent results with a single rudder.

Twin rudders placed at the ends of the stabilizer are out of the prop wash and therefore the tail is not blown to one side by this flow of air which exceeds the speed of the plane. Therefore, the rate of turn can be made the same with and without the motor running if the flying speed and gliding speed are the same. Peculiarly, almost any R/C plane that is not overpowered, after it has been properly adjusted for a smooth non-stalling glide by adjusting C.G. and stabilizer incidence and a steady non-stalling climb (by motor down thrust), seems to give this condition.

With a single rudder on the center line of the ship, certain precautions



must be taken. It was shown by Walt Good that if the thrust line of the prop bisected the rudder and fin area so that the area above and below was equal, the twist of the airstream from the prop pushed in one direction on the top half and the other direction on the lower half, thereby neutralizing prop blast.

This is the reason for so many designs having the stabilizer at the bottom of the fuselage to give room for the correct location of the fin and movable rudder.

The author has found, however, that a box type fuselage with a flat upper surface blankets or obstructs the smooth airflow past the rudder in the glide, and the rudder becomes ineffective. A triangular shaped fuselage behind the radio compartment with the apex on top and the rudder on this apex overcomes this difficulty, and with a fast glide the single rudder becomes practically as effective as the twin.

The twin rudder, therefore, allows more latitude in fuselage design and location of the stabilizer, which can be mounted at the thrust line, or above if desired.

Twin rudders may be flat 1/8" balsa but a single fin should be a built-up section.

Relative Values

In addition to the specifications of the various parts of the airplane, relative values are just as important and are tabulated herewith in percent:

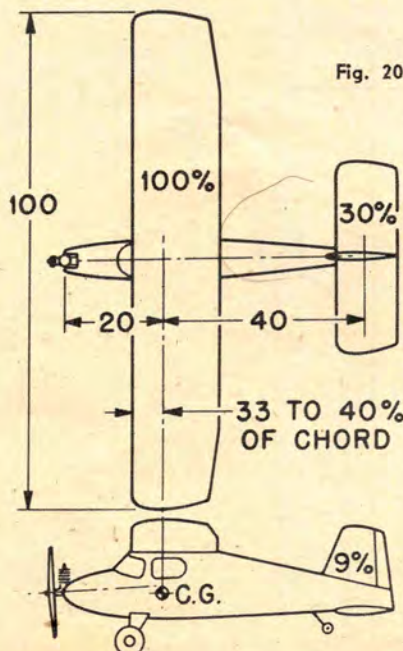


Fig. 20

Moment Arms

Wing width	100%
Stabilizer and fin moment arm center to center	40%
Nose moment arm to center of wing	20%

Areas

Wing area	100%
Stabilizer area	30%
Fin plus rudder area	9%

(In case of twin rudder add both together)

C.G. between 33 1/3% to 40% of wing chord measured from front of wing. (See Fig. 20)

Wing loading should be between 12 and 14 oz. per sq. ft. (Weight of plane with radio divided by area of wing in square feet.)

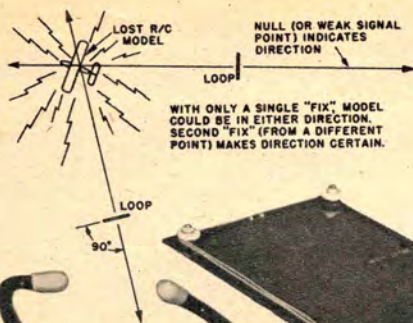
Rather than discuss power loading, a figure that allows the proper choice of engine is more important. Since engines are rated in displacement rather than horsepower, and assuming that the most efficient propeller is used, we arrive at a quotient called displacement loading (displacement of engine divided by the weight of the plane). This should be between .04 and .05.

For illustration: A 4 ft. plane loaded weighs about 2 1/2 lbs., and an .099 will just fly it. The factor here is .0396. A 5 ft. plane which comes out weighing about 3 1/2 lbs. will be overpowered with an 0.19 as the factor is .057. If this is the only engine available, a larger than necessary prop should be used, such as an 11/6. There is now an 0.14 on the market that should be just right, as the factor for 3.5 is .04. (The above concerns power developed with G.P., not ignition.)

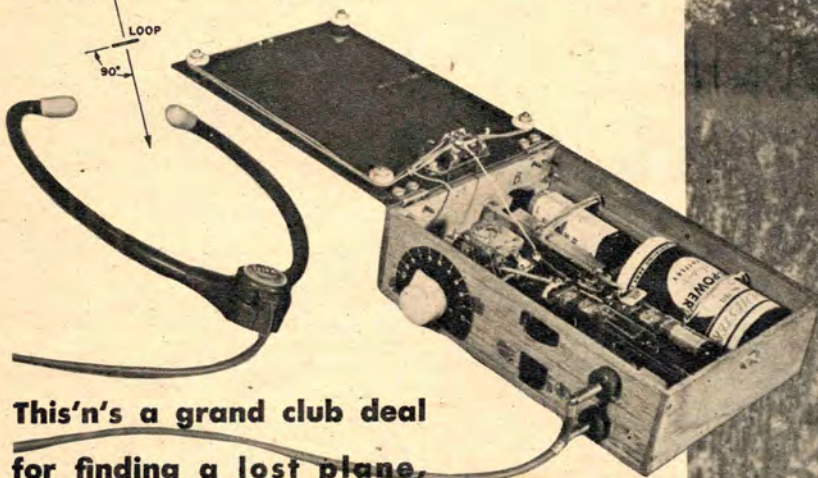


The foregoing has described what has been done with simple radio gear. The author's next ship will have a V tail, both 465 mc. and 27.255 mc. radio receivers in it (radios using hard tubes will not interfere on these frequencies even though next to each other), and two Bonner compound escapements. One radio will operate one movable fin on one side of the V, the other radio the other side. Push radio A once for right rudder, radio B once for left rudder. Push both radios once for up elevator and both radios twice for down elevator. If more right turn is needed, push radio A once and B twice and rudder action is doubled. Vice versa for violent left. Hope it works! (Below: author's test ships.)





SIMPLE DIRECTION FINDING



**This'n's a grand club deal
for finding a lost plane,
checking xmtrs & soft music**

D/FoR/C

■ How many times have you heard an R/C flyer say that he lost his plane because the escapement stuck—or ran out of turns, or someone leaned against his transmitter antenna, or there was interference? There are many other reasons why a well-checked R/C plane will wander off without control, not the least of which is strong winds or thermals. (Yeh, this is supposed to be "radio control," but things can go wrong at times!)

Did you ever stop to think that in many of these out-of-control flights, the receiver in the plane is working perfectly well, and usually continues to do so after the plane lands? Some R/C flyers do not realize that the receiver is also a miniature transmitter, and puts out signals that may be heard many hundred feet on a sensitive receiver. Why not provide such a receiver in compact and easily portable form, and to make things even easier, equip it with a loop antenna? This is just what has been done and the result is shown here. In addition to checking direction, the tiny receiver will double-check on suspected interfering signals, and even help you locate them. Also, it may be used as a very low power transmitter for sensitivity tests of the plane receivers.

The unit shown was made with a switching arrangement, so that it may be used on two ranges of frequencies—the entire 50-54 mc. ham band, and a range of about 26.950-29.50 mc. The latter covers the 27 mc. ham band, the 27.255 mc. R/C spot, and most of the ham 10 meter band. The finder is thus of considerable use to a wide variety of R/C operators and is an ideal club construction project, for this reason.

The case was made from a cut-down cigar box, with the cover upon which the loop is mounted made of 1/16" thick linen Bakelite. The case as shown is plenty big enough to hold long-lasting batteries, and yet small enough to be tucked away in a tool box when not in use. A single 22½ V. battery of the type used by a majority of R/C flyers in their planes supplies the high voltage, but room is provided for the next larger size, if desired. The A cell may be any of the various flashlight units up to the size D. Spring clips make contact with the power supply, and may be bent to fit the various sizes mentioned; the batteries are held in by rubber bands.

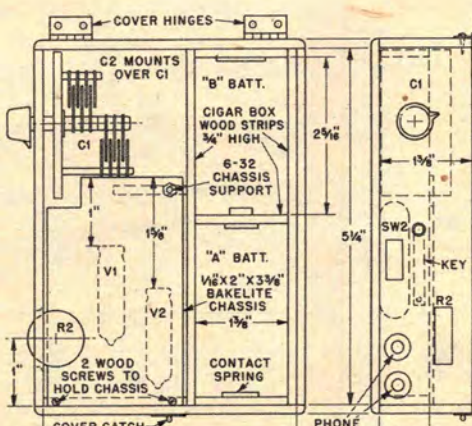
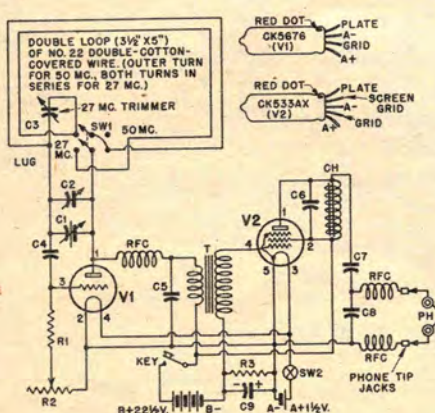
One unusual feature is the RF chokes in the phone leads. These were found to make the direction finding action considerably better, since they isolate the head-

phones and their leads, which otherwise act as an antenna.

Make up the box first and cut and drill the "chassis." The tuning condenser C1 is made by altering the parts of a National UMA-25 condenser to make a so-called split stator condenser. This is required in order to be able to tune the condenser without troublesome hand-capacity. Remove all the fixed plates but four from the long screws, and reassemble these with the spacers. Then on two additional #4 screws, assemble another four fixed plates. Heat the rear bushing of the variable plates with a soldering iron and remove. Take off all but three plates, put on two spacers, then three more plates and clamp tight, with the upper and lower groups of three 180 deg. apart.

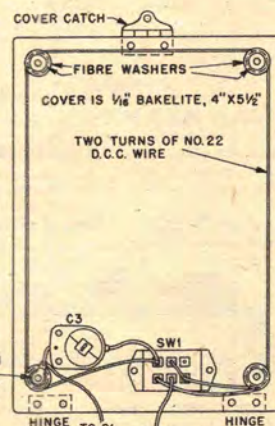
The tubes, transformer, and rheostat R2 are on the Bakelite chassis, and may be wired up before the assembly is fastened in the case. You can use sockets for the tubes, or solder the leads right into the circuit, using eyelets or small lugs, as in some of the commercial R/C receivers.

The loop is wound in two turns, with the ends soldered to the switch terminals. The turns are supported away from the cover on fiber or (Continued on page 56)



FRONT VIEW OF CASE

SIDE VIEW



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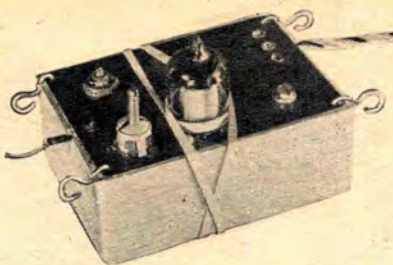
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McEntee's

Simple/Single Hard Tube Receiver

(Detailed construction notes on 1-tube—schematic in July issue)

1. Connect socket to terminal 7 (viewed from bottom) to battery lug 1; solder both ends.

2. Connect socket terminal 5 to battery lug 2, but do not solder either end.

3. Turn L2 so the green and black terminals face C1. Run a wire covered with spaghetti from the black terminal of L2 to outer terminal of C1, and on down to antenna lug. Do not solder C1 terminal yet.

4. Connect one end of C2 to socket terminal 3 (do not solder), and run the other end through the green lug on L2 (solder), then down to the inner lug of C1 (solder).

5. Connect R between socket terminals 3 and 5; solder both ends.

6. Run lead from upper terminal of L1, through socket terminals 2 and 4; solder all three points.

7. Connect RFC from blue terminal on L2 to outer lug on C1, and bend wire around to reach lower lug on L1. Solder all three points.

8. Connect 3/4" length of wire to lug on relay nearest aluminum base (this is the armature connection), and 1 1/4" length to the red-painted lug. Mount relay on chassis, turning red and black lugs downward if needed, to clear tube socket support and receiver bottom cover.

9. Connect red lug on L2 (do not solder) to black painted lug on relay (solder).

10. Run C3 from red lug on L2 to battery lug 2. Solder both ends.

11. Connect red lug on relay to battery lug 3, and armature lug to battery terminal lug 2. Solder.

12. Check all connections made, and solder any joints previously missed.

13. Connect 2 ft. flexible wire to antenna lug.

Connections to batteries may now be made, and the set fired up. A meter of 0-3 ma. is ideal for this receiver, but either 0-2 or 0-5 will do. It should be noted most carefully that, although the 3S4 is a double filament tube, and most circuits require that both halves of the filament be connected in parallel for 1.5 V. use, we utilize only half the filament, thus cutting A current drain down to 50 ma.

Turn on the receiver and check the current drain; if it is lower than about 1.5 ma., unscrew C1 turn screw clockwise (as you look at it from the tube tip side of the chassis) till the plate current jumps up-



BUILDING STEPS For the Beginner

ward. It should read between 1.75 and 2.1 ma., depending upon the condition of the batteries and the tube used. Note the point of rotation where the current just jumps up from a low value, to the higher value. This is the most sensitive spot, but the screw should be given another half turn in the same direction, to reach a stable operating point.

Needless to say, if the plate current was high when you first turned on the receiver, the screw in C1 should be rotated the opposite way, till the current just dropped, then backed up a half turn. The plate current change point is very abrupt—you won't have any doubt when you reach it.

Now set up a transmitter nearby, with no antenna, and a lamp bulb load, turn it on, and adjust the core of L1 till you get the greatest drop. That's all there is to it! Of course, adjustments made on the bench, and with the transmitter nearby, are only temporary. You will have to make final adjustment of both sensitivity and tuning in the receiver, after the set is mounted in your plane, the antenna attached as it will be used, and you can get several hundred yards away from the transmitter.

No more than 2 ft. of antenna should be used. You can mount it vertical or any other way you desire, but—as with any other R/C receiver antenna—it should not closely parallel metal rudder pushrods or other metal parts of the plane. A vertical piece of music wire is the simplest antenna (bend a loop in the free end, so you won't get poked in the eye with it!)

The two-foot antenna we have specified will do the job, if there is not a long lead from the receiver to the antenna itself (remember, the entire length of wire from the end of L1 to the tip should be figured in). If you have a metal pushrod to the rudder, or the escapement is located in the tail of the ship, with resultant long leads to it, it might be necessary to use an antenna series condenser. This may be a fixed ceramic unit of about 10mmf. value—there is no necessity to use a variable condenser here. Need for such a condenser will be shown by the fact that the padder must be screwed up very tight, to get the plate current drop.

The "antenna" on your plane is not only
(Continued on page 59)

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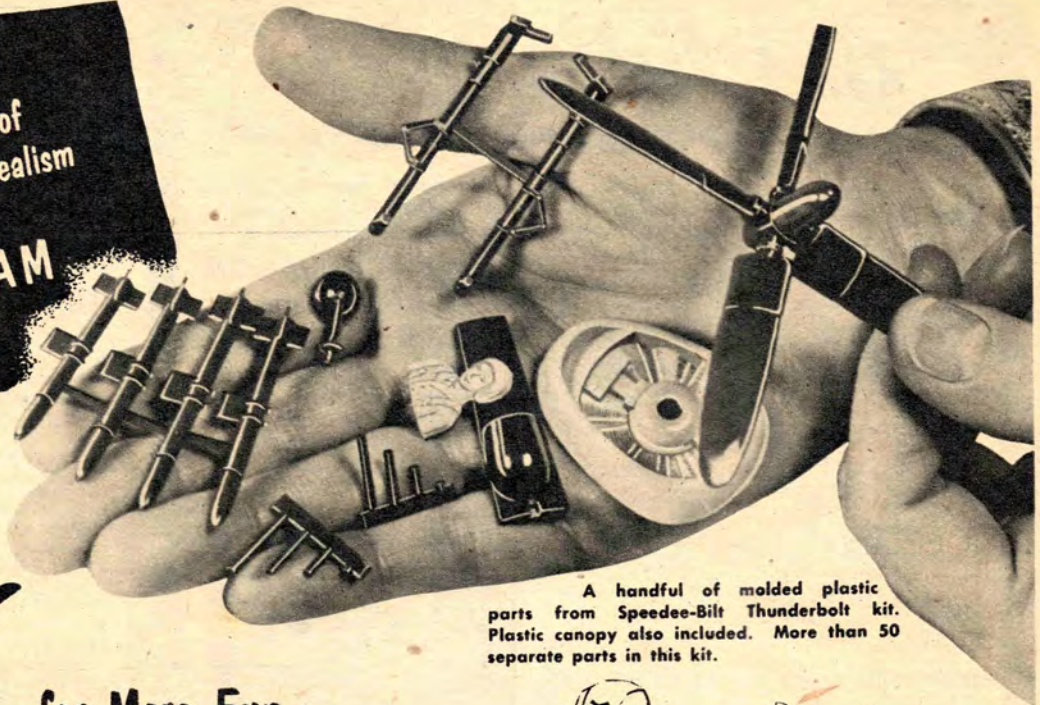
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D/For/C

(Continued from page 53)

Bakelite washers, and the wire should be fairly heavy. Very thin flexible hookup wire was used here, but something around #22 DCC will do as well.

The suggested location for the phone jacks and rheostat are different than in the model, as they will be easier to mount. As a matter of fact, several changes have been made in the unit since it was first built and photographed. There is now a trimmer for each band, that for 50 mc. being attached to the two stator sections of C1 (this is shown in the photo), and C3—the trimmer for 27 1/4 mc. is on the cover. A little key was inserted in the B+ lead, which enables the unit to be keyed rapidly to check escapements, etc. These improvements are shown in the drawings.

The use of CH makes it possible to employ the Finder as a test transmitter without having to have the phones plugged in. If the choke were omitted and the phones connected from plate to screen grid of V2, the latter would be damaged, if the plate voltage were turned on with no phones connected. There is plenty of room for both CH and T under the chassis, but the cores should be at right angles to each other.

The two RF chokes on the jacks are the same as the one in the plate circuit of V1, and should be kept near the jacks and away from other wiring as much as possible.

There is nothing to getting the set into operation except turning on the switch and varying the rheostat till a good strong hiss is heard in the phones. Then set condenser C2 so that the tuning dial covers the 50mc. band. Switch to 27 mc., and set this band with C3.

In use, the cover is opened and turned upward as shown in one of the photos; then the whole set is turned, after a signal is tuned in, till a decided weak direction is noted. There will be two of these weak spots, 180 deg. apart, and there is no sim-

(Continued on page 58)

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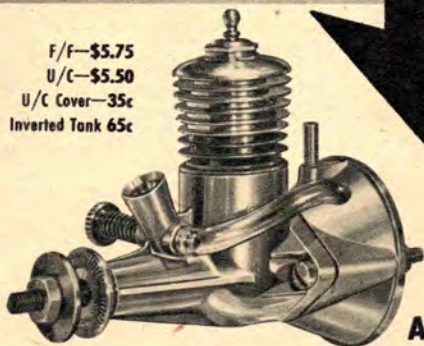
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Other
Places

AMERICAN LEGION CONTEST

Held April 7th at
SANTA ANA, CALIFORNIA
Naval Air Station

(Site of the National Indoor Events)

Yes, modelers, the new Atwood .049 engines really "cleaned up" against all competition. This was the first big event of the season. It was a definite preview of things to come. Here is a partial list of ATWOOD-POWERED winners!

1st—1/2 A OPEN SWEEPSTAKES
Toshi Matsuda—Time: 15' 29.2"

1st—1/2 A JUNIOR EVENT
Wally Richards—Time: 16' 21"

4th—1/2 A OPEN
W. S. Casselberry

Join the "Big Switch"

—to this more powerful 1/2 A engine that's really hot and more adaptable. An engine with new, different, improved timing, larger crankshaft and by-pass area.

Watch for the new Atwood .15 International—same design as our .049. And don't forget our .051—all based on 20 years experience.

ATWOOD MOTORS

3716 Park Place, Montrose, Calif.

And Then
WINS

1st—1/2 A JR. PAA EVENT
Don Puskerich

2nd & 3rd—SR. PAA EVENT
Verne Pitt—Dick Everett

3rd, 6th, 7th, 8th, 9th, 10th
in 1/2 A FF OPEN EVENT

BAKERSFIELD ANNUAL MODEL
CONTEST—Bakersfield, Calif.

April 12th

No Wonder

—more and more top flight model builders who demand only the best engine money can buy are switching to Atwoods. They have tried them all.

(Continued from page 56)
ple way to tell which way to go, to get to the plane. However, if you start off the wrong way, the signal will soon get weaker. Another way to double-check the direction is to make several observations a hundred feet or so apart; the lines from the loop to the plane will intersect at the desired point.

It has been found best to adjust the rheostat until the plane receiver gives a strong squeal in the phones. Then in the direction of the plane, the squeal will vary noticeably in tone as the loop is rotated. You will also notice that the signal gets weaker every half wave, as you walk toward or away from the plane; these weak points will be about 9 ft. apart on the 50 mc. band and 16 ft. or so on 27.

With a strong signal from the receiver, you can get a much more accurate "take" on the plane, if you move to one of these weak points. Conversely, if you don't hear the plane when you first turn on the receiver, move around a bit, as you may be in a "dead" spot.

A little practice will soon show how to use the finder to best advantage, and how the output from different types of receivers sounds. But be sure you do practice—and before the plane is lost, not after! If the rheostat is turned to the zero resistance point, tube V1 will cease supering, but will act as a very low power transmitter. In this condition it is ideal for checking plane receivers for sensitivity.

We hope you will never have to use the unit for its main purpose, but if the occasion does arise, it will cut the time spent on those lost plane hunts drastically. And if you get fed up with R/C, you can always tune in some soft music that the set will pick up on the FM or TV bands, if C2 is shifted to the right spot.

Parts List

R1—20,000 ohm, 1/2 W. R2—2 meg. variable, CRL type B16-122. R3—1500 ohm 1/2 W. C1—Modified National UMA 25. C2, C3—3-13 ceramic trimmer, CRL 822BZ. C4, C8—100 mmf, CRL D6-101. C5, C7—.005 mf, CRL DM-502. C6—.001 mf, CRL DM-102. C9—5mf, 50 V. electrolytic. V1—Raytheon CK 5676. V2—Raytheon CK 534 AX. T—Miniature 3-1 A. F. trans., UTCSSO-3. SW-1—DPDT slide sw. SW2—SPST slide sw. PH—Telex Monoset, 2000 ohms, with phone tips on cord. A-1 1/2 V. Winchester size D. B—22 1/2 V. Olin O915. RFC—135T #34 en. wire on form 1/4" dia. x 1" long. Sockets—5 prong sub-miniature, Cinch. CH—Miniature AF choke, UTC SSO5. Key—2 metal strips & Bakelite button.

Salty Dog Cabinette

(Continued from page 51)

to the bottom. The engine or motor mount is next built, this being made up as a single unit—to allow easy alignment of the engine and shafting. When the final location is obtained, cement it solidly to the floor. The transom is cut a little oversized and cemented in place. Trim and sand when dry. The forward deck is made up by cementing the blocks together and then cementing in place.

Carving can be best done with a butcher's boning knife. By following the templates no trouble should be encountered. The keel can be cemented in place. Drill through the bottom of the keel up through the floor and through the engine mount, then it can be bolted in place.

If a cabin is desired cut the sides and front from plywood and assemble as shown. All the celluloid windows should be cemented to the inside after painting is completed. The top, held in place with rubber bands, is carved while in position so as to have it match the cabin outline. The rub rails are half-round hardwood cemented to the sides where indicated. The trimming can be cut from mahogany veneer and cemented in place.

Give the entire job several coats of clear dope and sand well; if glow plug operation is anticipated be sure to apply fuel proofing to the entire hull.

Mount the power supply attaching the shaft along with the strut. One rudder is

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Fits Standard
Screw Top
Can

Half Pint
Pint
69c
Quart
79c



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used for controlling the model while the other works as a counter adjustment for correcting any undesirable turn while neutral radio rudder is employed.

We used the E. D. clockwork escapement along with the E. D. Boomerang receiver. And we used a large battery supply which gave us great reliability at all times.

Mount your equipment as you desire. However, keep the hull balanced as shown on the plan by the water line. Keep the batteries above the floor for protection in the event of water splashing in. Locate the pot, switches and plug-ins at the rear for accessibility. Fittings can be purchased in the marine department at your local hobby store. Take your time in building and finishing and you will have a model to hand down to your grandchildren.

(And besides, chum, a good job will perform better for their grandpappy.)

Simple/Single

(Continued from page 54)

the part that sticks up above the fuselage—it is all metal parts in the plane that are tied to the receiver. If you find hand-capacity effect troublesome, the 10 mmf. series condenser will greatly reduce this also.

The relay we used in the original receiver is of the polarized type, and must be connected into the circuit as we specify in the wiring steps. Due to the values of idling current, and the amount of current change with signal, many other makes of relays may be used, including some of the cheaper surplus types—if they are around 4000 ohms resistance. We set the relay to pull in at 1.5 ma., and release at 1 ma.

The simplest way to do this is to connect the B battery and plate meter to the receiver as you would for normal use. Remove the tube from the socket for safety, then connect a variable resistor of 50,000 ohms or more from the red lug on L2 to B minus. Turn the screw contact, against which the armature rests when the receiver is turned off, till the relay will pull in—or operate—at 1.5 ma. Then turn the other contact till it will drop out at 1 ma., as the current is reduced.

We have tried out this receiver with many different makes of 3S4 tubes; some of them proved to be more sensitive than others, but all were quite workable—including some used surplus 3S4's. The tube specified in the parts list has been found entirely satisfactory.

As a measure of protection against handling, and to keep dirt out of the relay and other parts, a bottom cover of 1/16" balsa was made. It is held on with a rubber band, and adds practically no weight. Incidentally the receiver shown—less cover and battery leads, but with tube—weighs about 3.5 oz. It has been operated over a half mile on the ground, from a 3A4 transmitter. With a normal tube and fresh batteries, the idling current, as stated previously, should be around 1.8 to 2 ma. With a strong signal this will drop to .75 ma. or less. Even a weak signal will drop the current to about the same value.

During the distance checks, we got tired walking after one half mile, so do not know just what the maximum range might be but it is farther than you can see what your plane is doing, that's for sure!



"This thing is making so much noise that I just can't hear a word you're saying!"

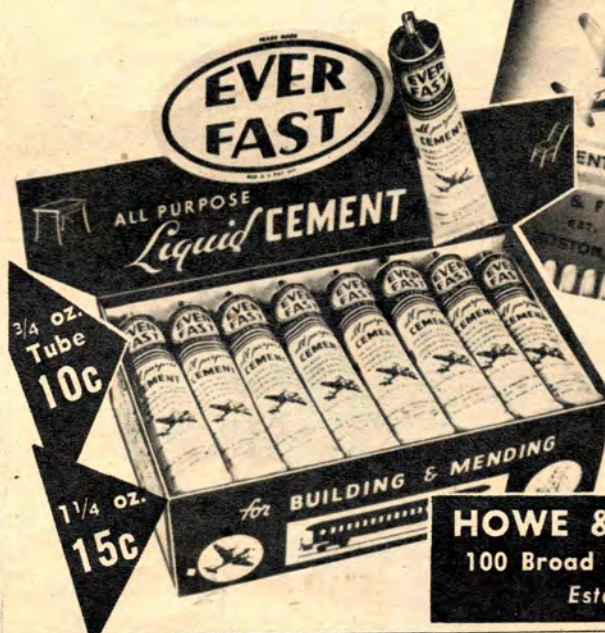
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CONTEST CALENDAR

List meets here! Advise Air Trails 90 days in advance to do the most good for your meet. If any area restrictions on entries, be sure to state. Areas of contact man in same city as site of meet unless otherwise specified. Where info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered—OR; outdoor hand launched gliders—OHLG; indoor glider—IG; towline gliders—TL; free flight gas—FF; control line stunt—CLSC; control line scale—CLSC; control line stunt—ST; team racing—TR; combat—COM; radio control—RC; rise-off-water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; control line endurance—CLEND; Wakefield—WAK; PAA—Load—PAA.

- July 7-16—Elmira, N. Y. National Soaring Contest.
- July 9-12—Detroit International Aviation Exposition.
- July 11-12—Detroit, Exchange Meet restricted to Mich. residents. F. P. Sposite, 9900 E. Jefferson.
- July 11-12—Ada, Okla. Jaycee-Plymouth meet. R. E. Descaens, 528 E. Main.
- July 11-12—Boston & Rockland, Mass. Kiwanis meet. E. O. Dohy, 25 Exchange St., Rockland.
- July 12—Alexandria, La. Exchange Club meet. H. R. Mustard, 2017 Jackson.
- July 12—Salt Lake City, S.L.A.M. meet. ST; CLSC; SP; FF; COM; RC. Saltair Model Port; 12 mi. West on U. S. 40.
- July 12—Moline, Ill. Ill.-Iowa U/C meet. Jack Stucker, 4105 14th Ave., Rock Island.
- July 12—Olympia, Wash. OMAC's annual U/C meet. E. F. Witt, Box 134, Lakeview.
- July 12—Medford, Ore. Prop Nuts record trials. R. L. Ottoman, Rt. 2 Box 358.
- July 12—McKeesport, Pa. Keystone Clippers meet. Ralph De Cecco, 513-13th St.
- July 12—Ithaca, N. Y. Plymouth C of C meet. P. O. Vorhis, Bx 382, Trumansburg.
- July 12—Waynesboro, Pa. Exchange Club meet. R. S. Fleming, 328 Walnut.
- July 12—Spartanburg, S. C. All-Dixie Championships. SP; ST; J; COM; CLSC; FF; OR; OHLG; TL; RC; M. M. Burley, Jr., 135 Oakwood Ave.
- July 12—Evansville, Ind. Model Flying Circus. V. M. Kays, 15 Main.
- July 19—Bloomington, Ind. Plymouth, Exchange Club, Bob's Hobby Shop meet. R. R. Davis, 515 E. Smith.
- July 19—Kohler, Wisc. Flying Tomahawks, F/F meet. W. A. Lea, 1030 N. 14th St., Sheboygan.
- July 19—Greenville, S. C.—Torque Flyers meet. J. W. Scharp, Jr., c/o Southern Bell Tel. & Tel. Co.
- July 19—Grimes, Iowa. Des Moines Modelaires meet. C. R. Gould, 3840 38th St., Des Moines.
- July 19—Greenville, Ohio. Jaycee's meet. Jim Trissel, 215 Wayne Ave.
- July 19—Fayetteville, N. C. E. Carolina meet; SP; COM; SCALE BEAUTY; ST; J. S. A. Lambert, 361 Gillespie St.
- July 19—Midland, Mich. Plymouth meet. F. J. Lowes, 608 E. Ellsworth.
- July 20—Andrews AFB, Md. Air Force World-Wide Qualifying meet. Major Robert P. Parsons, Chief, Arts & Crafts Sect., Special Services Branch HQ, USAF, Pentagon, Washington 25, D. C.
- July 27-Aug. 2—Lakehurst, N. J. & Willow Grove, Pa. 22nd National Championship Contest. A.M.A. 1025 Conn. Ave., N. W., Wash. 6, D.C.

(Continued on page 62)

Radio Control NOTES from Tornado

VALUABLE TIPS

For the beginner making his first attempt at Radio Control flying and those not too familiar with engine and prop combinations.

Using any 48 to 54 inch span-wing loading up to 16 oz. per sq. ft.

ENGINES: OK CUB .099, on this engine it is necessary to reduce the venturi opening by 50 per cent. This will allow better fuel adjustment for hand launching and violent maneuvering. Set needle on rich side of peak so that in climb engine is fully at peak RPM. ARDEN .099 works well as is.

Right thrust your engine 2° to 3°—this has been found ideal.

PROPS

FIRST TEST FLIGHT and LOW ALTITUDE FLYING—Use TORNADO R.C. 10 in. dia., 2 in. pitch. This gives a flying speed of 14 mph, 100 ft. altitude gain per min. MANEUVERS and MILD STUNTS—Use TORNADO PLASTICOTE 9 in. dia., 3 in. pitch. This will give a speed of 18 mph, altitude gain 350 ft. per min. HIGH ALTITUDE and VIOLENT MANEUVERS—Use TORNADO PLASTICOTE 9 in. dia., 4 in. pitch. . . for speed of 20 mph, altitude gain 350 ft. per min. All speeds and altitude gains are approximate, depending upon engine condition, fuel, wing loading. The use of 1 oz. Castor Oil per pint of packaged fuels is advised to offset extra engine load of large diameter props. Use HOT Glo Plugs. R. C. PROPS 10 in. dia., 2-3-4 in. pitch, 0.35c ea. Plasticote Props 9 in. dia., 3-4-5-6-7 in. pitch 0.25c ea.

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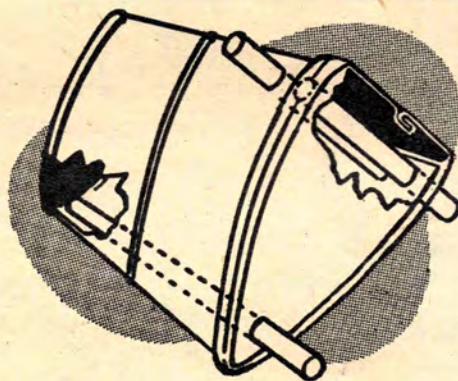


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(Continued from page 60)

July 12—Lexington, Ky. Exchange State Meet includes RC. Jim Marvin, 1610 S. Limestone.
Aug. 2—Taft, Calif. Condors record trails. Francis Stewart, 900-21st St., Bakersfield.
Aug. 9—Hackensack, N. J. Rotary meet. CLSC: COM: TL: RC: SCALE BEAUTY. Kenneth Setzer, 113 Moore, Rt. 2, Box 358.
Aug. 9—Medford, Ore. Prop Nuts meet. R. L. Ottoman, Rt. 2, Box 358.

Aug. 19 to 24—Detroit, Mich. International Plymouth Modelplane Contest. See your local Plymouth dealer.
Aug. 30—Brooklyn, N. Y.—Mirror Model Flying Fair at Floyd Bennett N.A.S. Daily Mirror, East 45th St., N.Y.C.
(See also contest mention in Dope Can, R/C, Southern Scene, and Western Roundup columns.)

Alberto

(Continued from page 21)

a man of many moods, sometimes grave, sometimes gay. It was when he was in one of the former that I asked him, one day, how it was that the air pioneers like himself could summon up sufficient courage to go on risking their lives, as they did constantly, in all sorts of purely experimental flying craft.

Alberto looked at me with an odd little smile.

"It's not that we are so very brave, my friend," he said. "It's simply that we forget ourselves. We're so anxious to see how something we've just designed will operate, when it is actually up in the air, that we haven't time to think of anything else—not even our own safety. The one idea in our minds is to find out whether our calculations have been right or wrong. One doesn't ask oneself: 'Shall I be killed?' All that you're really saying to yourself is: 'Now I've a chance to prove or disprove some theory on which I've been working.'"

There, in a nutshell, you have the whole philosophy of those men, those never-to-be-forgotten heroes who risked and too often lost their lives in the first great conquests of the air.



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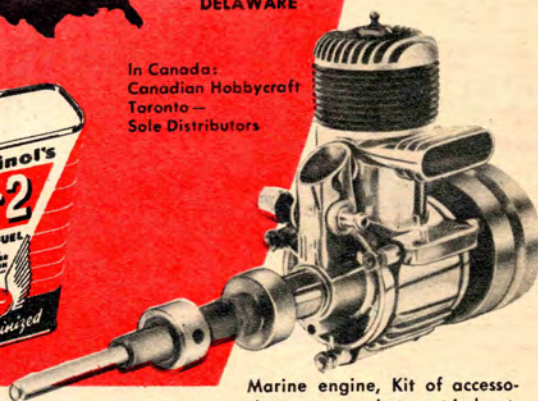
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The Model Biz

Inside dope from the model industry; kits, engines & accessories

■ X-acto Crescent Products has some slick new items: carbon twist drills, frin- stance, which range in size from #80 to #45. The 61 to 80 sizes sell for \$3.60 a dozen; 45 to 60, \$2.50 per doz. Then there's the No. 21D combination hand drill and pin vise @ \$1 to take the aforementioned drills. And lots more; things that will help you cut down construction time and produce better looking models . . . Letter here



Model Industry Association treasurer Charles Miller (lt.) with mad-modeler Charlie McCarthy and Edgar Bergen. Miller presented Bergen with a service award for hobby work.

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from Leroy M. Cox, president of the Cox Mfg. Co. regarding the Motor-of-the-Month article on the Thermal Hopper in this issue. Sez Roy: "I've always been in favor of such articles being prepared with no punches pulled providing all are treated equally. There is one thing you can do for us, and it is strictly fact. Examination of the engines submitted—in fact, a quick glance at the piston—will show that these engines have never been fired up before you got them; not even for an instant. Any firing up will leave signs on the piston. These engines therefore could not have been selected, hot engines. They were picked as run, off the line." . . . The Electronic and Hobbycraft Stores down in Philly have a new 1953 A-B-C (airplanes-boats-crafts) catalog available. From 130 W. Chelton Ave., Philadelphia 44—25c (no stamps) . . . Finally found out what the trade calls a built-up type plane kit; y' know, the one with formers, long-rons, paper covering, etc. "Strip-and-paper" kits. . . . Loud whisper blowing in from Philadelphia way says there's big news coming from Sterling in the R/C field—and they don't mean boats. . . . Bill Effinger of Berkeley suggests engine classifications along the FAI lines: up to .0375 cubic inch displacement, from .0375 to .075, from .075 to .15, from .15 to .30, from .30 to .60. . . . Leon Shulman was appointed chairman of the AMA Contest Board.

Frank Garcher advises of new address for Midwest Products Co.: 6005 East Dunes Highway, Gary, Ind. . . . Russ Gass, veteran model builder and head timer at last year's Nats is now the "inside" salesman at Western Model Distributors in L.A. Robert E. Moncrieff, past pres. of Flight Masters and the Southern Calif. Model Assoc., is succeeding Gass as WMD's salesman for the South. Calif. beach areas, Orange County and San Diego. . . . The first edition of the Nelda Blue Book of Hobbies has been distributed. It includes 4,378 (count 'em!) price listings and 2,135 illustrations of model planes, trains, ships, cars, tools and the like. Dick Robbins supervised compilation, the most extensive yet.

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models

Southern Scene

**SE'terns at Atlanta NAS:
N.O. gets \$2500 C/L site;
Georgia Tech backs boys**

■ Coffee with the Commander! Such was our privilege as Capt. S. M. Pickering, Commanding Officer of the Naval Air Station in Atlanta, bestowed upon your reporter all the courtesies of his high office and a cup of excellent java. The occasion was discussion regarding the "Greater Southeasterns" which will be held at the Naval Station.

It's a treat to share the company of a man who believes in the embryo designers, engineers, and pilots of tomorrow. With us was Lt. Commander E. W. Goshorn, a true patriot of the model cause.

Now news of the Bayou country: a model flying field is to be erected in New Orleans, just off the shores of Lake Pontchartrain. We congratulate Louis J. Rousset, president of the Orleans Levee District, and Paul Burvant of the New Orleans Aerial Club of 120 members. Six flying circles, enclosed in a plot measuring 380 by 320 feet, at estimated cost of \$2500 will be financed by the Levee Board. Half-circle concrete runways on two speed circles, grass on two 60-foot stunt and combat circles and on two 35-foot circles for small sport models—all surrounded by an eight-foot wire fence.

Here's a story to warm your hearts! Atlanta boys had been using parking lot on Georgia Tech property for Sunday afternoon flying. Suddenly, WHAM! The Dean of Men advised that some of his nearby residents (employees of Tech, too!) had complained about the noise and dire perils



Purty Ann Dean of Alexander City records news from Larry Parkerson for Southern Scene as Author Elliott (left) looks on. Certainly a unique system for column reporting, say we.

of ships that might come loose and tear through their homes like a tornado. The Dean said "nothing can be done." We appealed to Col. Blake Van Lear, President of Georgia Tech. He said, "This is Tech property and our boys and their friends may use it. If the nearby residents don't like it, let them move!" President Van was right; can you conceive of an institution like Georgia Tech, with its highly rated Aeronautical School, forbidding the future engineers and designers from testing out their creations?

By now you've likely read that Plymouth Internationals has added a "21 and over" Leader competition group. That's great news and undoubtedly many of you open men will be competing again. Great plans have been announced and they have available a color film "Sky Pals" which can be secured from Shows and Exhibits Department, Plymouth Motor Corporation, Detroit, Mich. Arrange to get this film and show it to your local Plymouth dealers. It will win you support from them.

One place where the Plymouth dealers are going great: Rome, Ga. Bob Lovell and Earl Lamb, two big Plymouth men in the city of seven hills, are making plans. It's just seventy miles from Atlanta so we are in position to produce a crew of officials and some darn good flyers from Tennessee, Alabama, and Georgia. Therefore, put a big circle around Rome on

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EDITED BY—Harvey A. Adams, Naval Architect, this NEW, LARGE 12"x9 1/2" heavy CLOTH BOUND volume contains every interesting detail on Power Boat Buildings. Score upon score of expertly written pages. Plans are included, which open out to DOUBLE PAGE SIZE, for RADIO CONTROLLED 47' Fairlie Bluff motor cruiser, the 51' Triton II cruiser for TWIN engines and Radio Control P.T. Boat for Radio. Additional plans are given for Jetercraft, 16" Sharpie, 18" Dinghy, 20" Racing Hydroplane, 30" Cabin Cruiser, British Torpedo Boat, etc. Complete details are shown for boat propeller design, automatic steering devices, self centering radio control, engine cooling methods, aircoops, special painting and hull construction methods. You can start at once with complete confidence to build any boat in this book. Radio Controlled or otherwise, every last minute detail is shown and explained to you in a simple and interesting manner.

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your map for a probable AMA sanctioned meet in early August. You'll be hearing final decision in our bi-monthly bulletin. Any fine sporting event is sure to get support from Sam King, City Commissioner.

Alexander City, Ala., stepped into the big league class with a wonderful one-day meet with Earl Louis Brewer the spark-plug; 142 entries despite overcast skies threatening all day. George Johnson of Smyrna, Ga., and Bob Elliott of Atlanta made clean sweeps in F/F and U/C. Johnson took all first-place trophies and a \$50 bond in free flight and Bob grabbed firsts in A, B, C, D speeds and stunt which netted him five trophies and a \$50 bond. His design of the Black Tiger (Berkeley's P-40 Warhawk) was also flown by Harris Grimes, 1951 Nat. Jr. Champion, and the "comer" Walter Pyron, who won firsts in senior and junior stunt.

Brewer is among the new state representatives just added to the Southeastern Federation of Model Airplane Organizations and Sponsors, Inc. Others are Bill Thomas, Jr. of Florida; Harold Lentz of South Carolina; Bob Davis and Jim Wade of Georgia; and Carl Miller of Tennessee. Need two representatives from Mississippi—who'll volunteer to work every week-end and nights in the interest of model aeronautics in Mississippi?

Jack McCain of the Rebelairs from Montgomery, Ala., comes up with something new in the South—team combat! This calls for tactics. The slower team of two flies high, the faster couple flies under and .19's are used in the ships. They are also running airboat free flights on the lake with hydroplane hulls and engines up to .35's. These average 35 inches and about 45 mph.

Henry Copeland is president of the new Club formed in Tuskegee, Ala. Richard Board, the hobby shop leader, is the man that keeps the ball rolling and the ships flying. Mostly a control line club.

Bob Davis, Hugh Leamon, Earl Lines, leaders and "old-timers" in the Buckhead Atlanta Club are devoting attention to the younger flyers. They have a three-course plan, starting with beginners, moving through senior, and into the "Ace" class as the flyers progress with requirements fitting each course. Then they "graduate" with honors and a fine background.

We submit that Ann Dean of Alexander City made history by becoming the first trained shorthand specialist ever to follow an AMA VP around and take notes for a national magazine. All the news in the column about Alabama was recorded by Miss Dean and later typed and sent to your reporter. This is being written on the eve of the Albany, Ga., meet and Don Kimsey has a Southern Belle to work with me in Albany. If she's as good (and pretty) as Ann Dean, our trip to Albany will have been doubly enjoyable!

Bill Thomas of Daytona Beach reports that three possible national speed records for Half-A may have been set in Deland, Fla. For motors 1/20th cu. in. displacement, Junior Tom Moore of Daytona clocked 69.44. In senior division Bob Peeples, Deland, did 68.19, and modestly Bill re-

(Continued on page 70)

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2045-47 N. Trenton Ave.,
Philadelphia, Pa.

Western Roundup

Omnimeet Shows All Types Can Compete Together Equally

■ The Santa Barbara Omnimeet proved to be a great success. This particular kind of contest might not be too adaptable to large gatherings, but it did demonstrate that it is possible to have meets for all types of models without allowing any one particular type or size an advantage.

The Santa Barbara gang allowed any



Ronnie St. Jean and his unusual flying wing free flight design, "Why." Model had a tendency to glide in inverted position until trailing edge tabs were mounted below on bottom surface.

kind of model to compete except hand-launch gliders. If a fellow had more than one type of ship, he was allowed to enter it. The models were all grouped together in one event, Wakefield, Nordic, FAI gas and all classes of free flight gas as set up by the AMA. Trophies and engines were given for the highest times made with all models grouped together. To encourage the entry of the International type model, they also put up trophies for high times for these.

The results were interesting to review, in that they showed that with the six-minute rules all models fly on an equal basis. The winning ship of H. R. Fredericks had an Arden .19 with a Powerhouse type wing and tail and an original fuselage. Second place was a Half-A original, while



"El Nordo IIA" by composer of "Western Roundup," Dick Everett. Model features solid balsa wing and tail (I). Fuselage is built up from 1/16 inch sheet. Total weight 16 ounces. "Super Glide."

CURTISS P40F GAS MODEL

New Improved Model



48" Span. Free flight or U Control
Improved with new 2 3/4" alum. spinner and 3" Veco alum. disk semi-pneumatic rubber wheels. Planked type body, parts printed on balsa, and all \$9.00 parts. Set

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9 foot span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" carved prop. tail wheel unit, 2 full size plans, printed balsa, silkspan, etc. Uses "C" type motor, single, twin, or 4 cyl. motor. Set without \$17.50 motor or wheels, postpaid. Extra pair of 4 1/2" airwheels, \$4.50

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33 1/2" Span. 1/2" Scale
Set has two alum. cowls and scale Veco rubber tired wheels. Model can use 1/2 A motors. Wasp. \$7.00 etc. Set less motor

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KIT
COMPLETE

60¢



Bob James and Nordic-event "Barracuda" tow-line glider which uses Cheeseman 14% airfoil section. Top of wing is 1/16" sheet balsa; also used partially on wing bottom and tail. 19 oz.

third place was a Wakefield. Fourth high time was a McCoy Diesel powered payload model, without a dummy but weighed up to FAI rules. The results were very much the same all the way down the line.

There were some interesting models at this contest. Stan Hill's Amazon "1000" had a new home-carved prop of very wide blades. The Fox .59 seemed to handle this huge fan very well. All Stan had to do was set the ship on the tail pointed straight up and release it; there was no indication of instability or lack of flying speed, since the ship immediately rose straight up, leveling off to a real good climb. This type of launch is one sure way of not having to worry about take-off area. However, don't try this with just any type of model at a crowded contest without first making sure your ship is capable of performing the feat. It is just possible that you might have to go to a higher pitch prop in order to accomplish the trick.

Bob James had a new Nordic which was certainly unusual. It was sure pretty with a multi-sided semi-round fuselage around a symmetrical center line. The wing had 3 deg. sweep and was sheeted completely on top and partially on the bottom using the 14% Cheeseman airfoil from Zaic's yearbook. The horizontal tail which was partially sheeted was mounted on top of the rudder, and when coupled with the center fuse wing certainly made the stab high. All this wood and a high finish, though, made the ship weigh in at 19 ounces, which we think is just a little too much weight.

Our new Nordic which is called "El Nordo IIA" because of its similarity to you know what, utilizes a type of construction very common to hand-launch gliders. It is all balsa. The wing was glued up of 1/4" and 3/16" sheets, the tail 1/8" balsa. Of course the wood was all of very light stock which required quite a bit of searching through numerous model shops. The previous 40-inch flat center section was increased to (Continued on page 74)



Stan Hill and his Amazon "1000" design. Ship is launched as shown. Question: is it ROG? That's one for the book! Power is Fox .59 swinging 14/8 prop. Completely covered with silk. Weighs 68 oz.

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3. Contest is for duration of flight, timed by stop-watch. Each Modeler is allowed five (5) flights. The longest flight counts. Models may be launched by hand or rubber band catapult. Time of flight begins when model is launched, and ends when it lands or passes from sight.
4. Model must be built by contestant from Top Flite Jigtime kit. No other parts may be used except to repair damage. However, propeller and rubber band may be any size, and do not need to be from kit. Sanding and doping permitted if contestant desires.
5. Official flights may be made at meets organized by contest directors or leader members of the Academy of Model Aeronautics, hobby store dealers, scout leaders, Y.M.C.A. or church youth leaders, teachers, club leaders, or similarly qualified persons.
6. Certificates of official flight shall be forwarded to Top Flite Models, Inc. Best flights postmarked no later than Sept. 30, 1953 shall be adjudged the winners, and shall receive the prizes listed.

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JUNIOR DIVISION (under 16 yrs.)

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(Continued from page 67)

ports that he took the open division with a brisk 77.58 mph. Why don't you fellows "open up" and let out-of-the-state boys enter? Everyone else does!

Al Kising of the Hi-Torque Club of Tampa sends his congratulations on the column. They are setting a fine example by admitting anyone from anywhere. Fifty flyers in their club, and strictly U-control. Lots of interest in combat. Regular monthly contests and big one planned for Sept. 13th. Write Al at 6118 Interbay Blvd., Tampa, Fla., for the dope. Al says, "We'd like to hear from other clubs, especially our neighbors in Florida to find out about their contests!"

So speak up, men!

We hear rumbling out of Orlando, Fla., home of the Tangerine Internationals. Some question if the meet will be abandoned. This meet has tremendous "tourist" value . . . worth the support of the Governor of Florida, the State Chamber of Commerce, and the C. of C. in Orlando. Open your eyes, Orlando Exchange Club. It's worth \$5,000 to you and the city to attract people from all over the nation!

News comes from Frank Huffman, VP out in Texas, about the promised Southwestern meet in early September. It will be at Fort Worth, or Dallas or Norman, Okla. Maurice Teter, who directed the '51 Nationals in Dallas, will be the CD. Write him at 2025 Abrams Road, Dallas, Tex.

In Philadelphia we'll be advocating an elimination plan to qualify for the Nationals. Local meets send all winners to the biggest meet in the District. District should raise the money to send winners to the Nationals. Then a National Championship will really represent champions and could be more quickly run off and with no time lost by fellows not in the championship bracket. The place for the novices and beginners is in Plymouth and area meets. If you agree with this, express yourself to your District Vice-President!

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"DIID" Rules

(Continued from page 23)

cover 1, 2 and 3 spaces respectively and do not overlap or extend over the center line or back line or into the Off Course Area. He also lays out his defensive units—Early Warning Radar (EWR), Ground Observer Corps (GOC), and Anti-Aircraft Unit (AA)—so they do not overlap or extend outside his main defensive playing area of 64 squares. It is permissible for any of these units to touch.

Shuffle the deck of direction cards and turn face down. Attacker starts by moving his LOW Altitude Bomber marker one space forward onto the Blue D Sector. Defender may move either of his Fighter Squadrons in LOW Altitude one space forward onto the Red D Sector. From this point on the attacker moves his Bombers in any direction except diagonally as instructed by the direction cards, except that as one move, instead of turning over a card, he may elect to change the altitude at which his squadron is operating. This altitude shift constitutes a "turn." Bombers must always go through MEDIUM Altitude when travelling from LOW to HIGH, or HIGH to LOW. The Attacker may change altitude at any time when it is his turn as his move, but must always observe this LOW-MEDIUM-HIGH, HIGH-MEDIUM-LOW sequence. He cannot skip the MEDIUM altitude change.

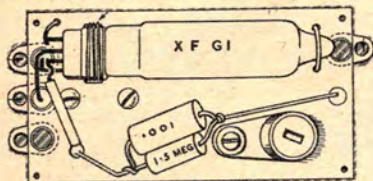
After each move by the Attacker, the Defender is permitted to move either of his two fighter squadrons in any direction except diagonally or make an altitude change in either, or bring his defensive units into action as detailed below.

Fighter Squadrons can fire on the Bomber Squadron only when the Bombers are within range (within two spaces of the Standard Jet Fighters and within 3 spaces of the All-Weather Jet Fighters) AND ONLY WHEN THE FIGHTERS ARE FLYING AT THE SAME ALTITUDE AS THE BOMBERS!

If the Bomber Squadron is forced into the Off Course Area it must remain there until a card is turned up by the Attacker during his regular turn which permits a move back onto the playing area. Bombers may be fired upon by fighters while they are in the Off Course Area if all are at the same altitude.

Both Bombers and Fighters may occupy positions ("squares") directly on top of any defensive units, but a Fighter Squadron may not be moved onto a position already occupied by the Bomber Squadron. If, however, the Bomber Squadron by

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direction of the playing cards is directed onto a position already occupied by a Fighter Squadron or can be moved onto that position, that Fighter Squadron must reform and position itself 3 squares (in any direction) away from the Bombers. This repositioning constitutes a move for the Defender.

The Defender cannot both change the position of a Fighter Squadron and have that Squadron fire upon the Bombers in a single move. He may change altitude or change position on one move, then wait until it is again his turn to play and say, "My All-Weather Fighters (or Standard Jet Fighters—whichever the case may be) are attacking." The Defender then turns over the top card to determine whether that Fighter Squadron which he has called into action scored a Hit or a Miss on the Bombers and keeps a count of his points.

Moving his Bomber Squadron as directed by the cards the Attacker makes a bombing run over the three targets. He may bomb them in any order, but each target can be bombed only once. The Attacker must move his Bomber Squadron marker directly onto the Shipyard, or on one of the squares of the Aircraft Factory or Atomic Energy Plant. At his next move he calls "Bombs Away" before he turns over the top playing card which informs him whether he has made a Hit, a Near Miss or a Miss. He receives no points for a Miss, but is credited with Near Miss and Hit points as indicated on the target markers.

While the attacker is making his bombing run, the Defender is not inactive. If he has positioned his defensive equipment and observer's post properly the Attacker must bring his bombers in over these units. Note carefully that the Ground Observer Corps (GOC) can detect the Bombers only if they are at LOW or MEDIUM altitudes, but not at HIGH altitude; the Early Warning Radar (EWR) and Anti-Aircraft Unit (AA) work only at MEDIUM and HIGH altitudes, but not at LOW altitude. This is why the Bombers may elect to change altitudes during flight. Sometimes the playing cards unexpectedly force the Bomber Squadron into range of the GOC, EWR or AA. When this happens the Defender says "My GOC has picked you up," "You're detected on my EWR," or "I'm firing my AA"—those exact words are not important, but the Defender is required to indicate that the Bombers are in range of one of his defensive units—then he turns over the next card to see if his AA unit has scored a hit on the bombers, or whether his GOC unit is "on the ball" and if so what favorable action results, or whether his EWR was alert—whichever applies.

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Since the Bomber Squadron represents many planes it cannot be completely knocked out of the air despite the many hits that may be scored by the AA unit or the two fighter Squadrons. The Attacker's aim is to make his bombing run, go in after the three targets and fly back to any one of his take-off fields (numbered 1 through 8) as quickly as possible—always making the moves directed by the playing cards. He must be in LOW Altitude position before he can cross over the last boundary line onto the safety of his home airport.

Either or both of the Fighter Squadrons may chase the Bomber Squadron back to its home base or intercept it on its approach. But if either fighter outfit moves onto a square occupied by the Ground-to-Air Rocket Units it shall be considered completely demolished and out of the game.

Totalling the Score: The Attacker is credited with those Hits and Near Misses he has made on any or all of the targets. These points are totaled. The Defender is credited with all points from the various hits his Fighter Squadrons and Anti-Aircraft Unit may have made on the bombers. These are totaled. Then, finally, the Defender's points are subtracted from the Attacker's points to give the final score for the Attacker. It is possible that he might end up with a minus (-) score!

The Playing Board is now turned around, The Attacker becomes the Defender, the bombing run is made, and the points are totaled. Then the player with the highest number of (plus) points as the Attacker is declared the winner.

The Editors of Air Trails are interested in your opinion of "DID"—would you like more such games occasionally in "AT"?

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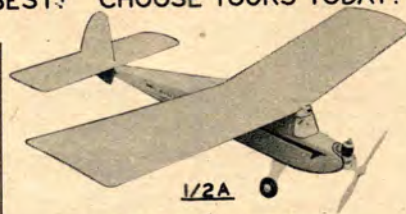
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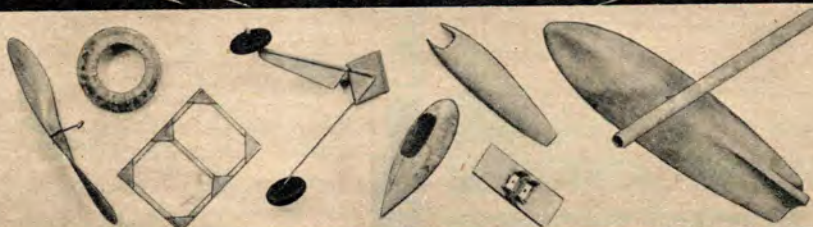
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JETS — SPEED — STUNT — RUBBER

Blow Bug

(Continued from page 34)

one, with never a failure.

The plan shows a six bucket blower. This is about the top load for an .049 engine, which is the smallest which should be used in this ship. However, experimenters may wish to try three, four or five-bladed blowers, which will save a little weight and allow the engine to wind up a bit faster. The engine, incidentally, should be well run-in; a jet model is a poor place to break in a tight motor. The needle-valve extension is needed because the carburetion changes when the hatch is slid in place, and to simplify starting.

Complete flying details are available on the full-size plans.

Western

(Continued from page 69)

48 inches, the same amount dehedral being used. The fuselage was shortened somewhat to keep the ballast weight low. Completed ship with a Hillcrest dethermalizer weighs in at just over 16 ounces, the increase in weight being more than made up for in its very flat glide.

We saw a Cumulus with a very high thrust line, the engine being inverted and a very small gear used. The ship was being tested, so no absolute conclusions were reached.

Don Tunes' winning FAI job was a Half-A-PAA-Load model with a McCoy Diesel. Since the model had to be weighted, Don used a ballast box in place of the payload man, mounting a Hillcrest dethermalizer in this box. The entire assembly occupied the payload space. This seems like a very practical application for FAI. That diesel had plenty of power. Don's ship grabbed lots of altitude.

Dick Baxter's winning Wakefield was a

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front-gear ship, very similar to his last year's design. This makes two contests in a row that he has won with different ships. Prop run is in the neighborhood of three minutes, which leaves only two minutes of glide for a maximum flight.

Bill Trumbull, who is back from the Army, flew Denny Davis' latest design "Sandy Faigen," a slightly redesigned version of his "Ultra Hogan." The ship boasts a slightly raised thrust line and has just over 400 square inches of wing area. The fuselage although only slightly different has by far the prettiest flowing lines of any of his designs. Power is a Cub .15.

The San Diego Aeromodelers—which is the Convair Club—had a rousing multi-event program consisting of something for everyone. Half-A-PAA, Half-A free flight and ABC combined for both juniors and the open contestants; in control line there was Half-A speed, proto speed where team races dominated and stunt for both age groups.

Bobby Baxter who entered only two events, Half-A-PAA and stunt, proved beyond a doubt that as a junior he builds the best models, winning both the events, topping all contestants in payload with a remarkable 16:51.5. This youngster has a very fine head for adjusting, usually ending up high in every event he enters. He, incidentally, was the guy on the cover of the Air Trails '53 Annual who was adjusting his engine.

Cliff Potts was another dual winner, first in proto speed and second in stunt. We followed on Tom Henebry's heels in Half-A and won ABC combined with the same modified Kiwi using an Atwood .051 for high time of 17:50.

Half-A speed was interesting, most fellows hand launching. Winning speed was over 60 mph on the new longer lines. Frank Swedberg and M. A. Quant won these events.

By far the most interesting model at the contest was Norman Cross's "Double Delta" flying wing. His latest is 36 inches in span and silked. A Space Bug is used for power (Continued on page 78)



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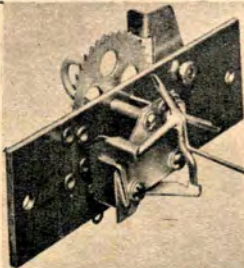
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Cloud-Copter "TR" (for "tail rotor") is one of two new Roy Clough-designed Berkeley kits. This goes for \$3.50. Takes .045 to .074 motors. Rotor is 25" in span. Fuselage: die-cut balsa; complete metal rotor mast assembly; metal blade holders quick replacement of blades.



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What next? Well, Polk's are suggesting pre-carved bird kits—s fact. These are of balsa wood for easy finishing. Capsules of oil paint with complete carving, finishing instructions. Four available @ \$1 each: Herring Gull, Scarlet Tanager, Goldfinch, Mallard Duck. Good for gifts.



BOIDS



LITTLE TEAM RACER

Southwestern Model Mfrs offer this slick Team Racer in the Half-A field of all-balsa construction. Parts are die-cut; wing is solid, the fuselage built up. Span is 14". Contour wheel pants and formed wire gear included, also the metal hardware plus tailcrank and bellcrank. Clean lines.

FOX 35

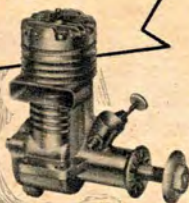
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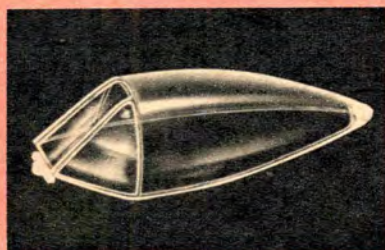
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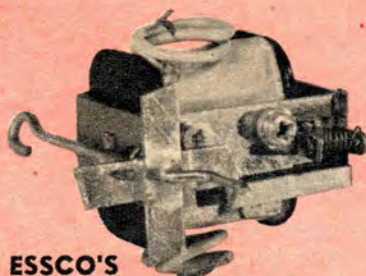
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MOLDED CANOPY

Molded of clear plastic for Half-A size models is this latest Sullivan Products (Pylon Brand wire) item. Price is 25¢. Reverse molding was employed for easy stripping; a centering pin makes for easy mounting. Matt Sullivan promises that 1 inch and 1 1/2 inch versions will be available to modelers soon.



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(Continued from page 15)

since it will run either way and easily handle the 10 ounces of weight. Norman found that he had to add lateral area forward of the cockpit for lateral stability, which led George Wagner to wonder if it didn't act as a fence. Whether it does or not is not known, but it is highly possible that this is just what its use accomplishes.

From all reports the San Valleers contest was by far the best the fellows ever attended. This gang of guys went all out and raked up trophies through ten places for all five events. They had engines to 5th and merchandise all the way down to 20th. Something novel and practical was the patch-up kits consisting of various sizes and widths of sheet balsa and a large tube of cement that were given with each entry. Their program was in each kit, and contained a real "nervous" explanation of what these models were and what they were supposed to do. The PA system kept everyone informed of the action taking place and in between announcements frazzled nerves were soothed with some real hep music.

Some very interesting events took place. First was that of Mike Kostich winning Half-A and beating that "newcomer" Sal Taibi. This is easy to say, for us real old-timers remember Kostich as the same fellow who held the duration record for gas back in 1936 with a monster of a gas job. Regular readers will remember that Mike showed up at the Nats as a spectator and was bitten by the bug again.

Toshi Matsuda, who is hotter than a fire-cracker this year, won A gas with a perfect 18 minutes, followed by Jim Devitt. Towline was won by Ed Slobod; Mervin Bristol won B-C. Old Wakefielder Lo Salisbury won rubber with 13:10.

In Sweepstakes event two placed. Mervin Bristol and Ed Slobod tied for first, so since each won half the trophy, they got half a trophy—yes, the San Valleers proceeded to saw the trophy in half and wore out two saws doing it! Ron Rounds won Jr. out and out, so they didn't have to saw this one.

We have managed to get in a tour of the Cameron factory, finally finding an excuse when Walt Good paid a visit recently. They have quite a set-up, making everything except the prop nut and the screws. All castings are turned out during the cool winter months. The rest of the work, machinery assembly, etc., during the remainder of the year. We witnessed recently the flight operations of their new two-speed and were quite surprised at the speed range. Bob has also developed a valve switch to shift from one needle valve to the other, and it is safe to say that at low speed it turned over less than 3500 rpm, on high speed with a 11/4 Top Flite over 10,000. So you can see that it really has a range. Bob reports that fuel consumption is very low, which led Walt into purchasing one of these engines for his coming FAI trial.

The Camerons are going into the radio field with the fuel switching valve and a down-to-earth low price escapement.

—DICK EVERETT

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Combo Trainer

(Continued from page 36)

shape per the drawing, slip it through the hanger opposite the propeller, and poke the end in the hole drilled in either end of the motor stick.

The prop shown is one of the 7" semi-carved jobs carried by many hobby shops. There are two shafts, installed as shown. Bend both shafts so the prop spins evenly no matter which one is in use, and balance the prop with care, too.

The rudder is fastened permanently to one side of the motor stick; it has to be offset to clear the rubber.

Complete flying details, are available on the full-size plans.

After you've had an opportunity to test your Combo flyer in its various forms, let the editors know which one worked out best for you.

McEntee on R/C

(Continued from page 49)

who predicted dire results. We thank R. J. Beckman and Ed Rockwood for this info. Incidentally, Ed has moved, and may now be reached at P. O. Box 6, Menlo Park, Calif. (This new address for Rockwood Radio Controls, too.) Ed also mentions that the PRCS has a new flying field at Centerport Airport; arrangements with the management include use of a clubroom, and large area of field is kept in condition for ROG take-offs. Only R/C allowed at this field.

Forrest Cole (Smyrna, Ga.) is back again with news of the Peach State; seems a lot of the R/C boys there are turning to scale models, among them L. R. Purty with an L5, Geo. Johnson and Fred Turner. Forrest sent along the simple switching scheme for two tube receivers that we diagram (asks



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to make FATHER'S DAY
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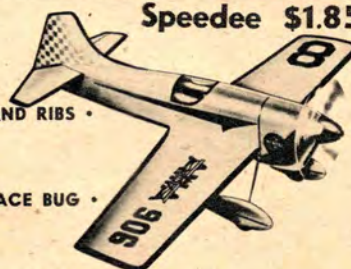
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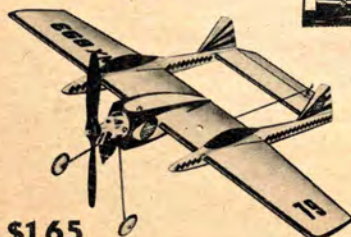


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POWER
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A "HUM-DINGER"
NICKEL-PLATED
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that we give credit for it to Bill Woodall, Thomaston, Ga.) He also inquired about possibility of obtaining back issues of Air Trails to bring his R/C file up to date. Many of these issues may be had from Editorial offices (304 E. 45th St., NY 17). Write for price list.

Quite a few of our "Mac II" transmitters have already been put into operation. We are getting some tips that should be of help to others who try this rig. In search for higher B voltage do not remove that .004 mf. condenser across the secondary of T3. This will raise the voltage a bit—but it will also burn up the vibrator very quickly. Voltage should be at least 230, as measured at SO1, with no load—that is, with the key open. If it is not this high, look for losses in the connections to vibrator and transformer from the storage cell. On some of the used PE-157 outfits, the rubber-covered lead from the cell has been found in bad shape. Also, some of the filter condensers (C10) may have developed leakage. Replace with dual 40 mf. 500v. unit, such as Aerovox AFH2-72. Don't forget to insulate the key jack J2 from the case, when you mount it.

Our thanks to Gerry McGeorge and John Worth for above notes.

We may have given some of the less experienced radio boys a bum steer, with our mention in the June Column of "plate input" for the transmitter. As noted, the F.C.C. allows 5 Watts plate input on 27 1/2 mc. If you use a screen grid tube connected as we show in the Mac II, the screen input power does not figure into the 5 Watts. However, if the tube is hooked up as a triode (May '52 issue, p. 10, for example) the total plate and screen current must be included, when you figure power input.

Commercial News. Several modelers have written us for plans on Alex Schneider's '52 Nats R/C winner. We don't have them, but you can get a set from R. J. Beckman (845 Riley Dr., Albany, Calif.). Cost is \$3.95, and you get two large plans sheets, several sheets of info on construction, radio installation, etc. Ship spans 7 1/2 ft.,

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WANTED: "Model Airplane News," "Air Trails," "Flying Models," "Flying Aces," "Model Aircraft Engineer"—1927-1950; pre-war C-D kits. Give price and condition. Mark Levinson, 1805 Ocean Ave., Brooklyn 30, N. Y.

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New concern is entering the R/C equipment field; Babcock Radio Eng., Inc. (Box 3097, Van Nuys, Calif.), who have made large quantities of receivers for target drones, have a new audio tone control system that is designed for absolute simplicity and reliability of operation. Receiver uses three miniature tubes, and a sealed relay; latter operates on current range from zero (key up) to 6 ma., on signal! Standby receiver current is 1.2 ma., going up to 8 ma. with sig. The receiver is "fail-safe," since relay current is zero, with or without carrier signal from trans. Latter uses three tubes, and supplies 1000 cycle audio tone when key is depressed. Self-contained batteries are fitted in the steel case, and the antenna is 1/12 wave (about 3' long. Retail prices are \$29.95 and \$39.95, for receiver and transmitter respectively, and they will be sold through usual hobby shop distribution.

Control Research (Box 9, Hampton, Va.) has moved to larger quarters—hopes to handle orders faster than was possible before. Same address. They have a limited supply of Willard BB54 2 Volt storage cells—the one we used in the Mac II—at a price of \$1.95 postpaid. Details of a simpler conversion for the PE-157 are supplied with their kits for above transmitter.

New production (not war surplus) miniature 6 V. storage batteries similar to those used in our TV Truck (June '53 A.T.) may be had from Hoffman Electronics Corp. (253 E. 72 St., NY 21). They are Willard units guaranteed to last several years, and to hold their charge; surplus NT6 batteries not too good in either category, though many boat and car builders use them. Hoffman also carries a matching charger.

Control Products (Box 1693, Fort Worth Tex.) is new concern selling parts and equipment for the R/C boys. Run by ex-BrainBuster (Hampton, Va.) Jesse Shepherd, who has plans for marketing his own design of receiver and transmitter very soon. Standard makes of R/C apparatus are now being supplied.

—HOWARD G. MC ENTEE

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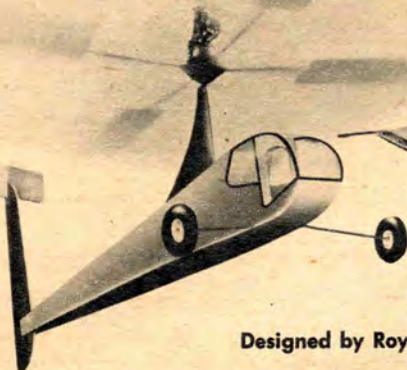
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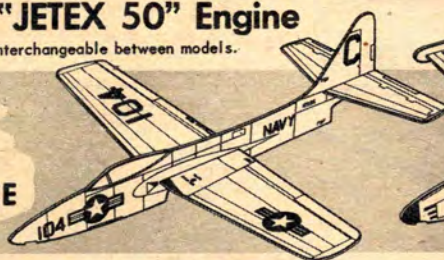
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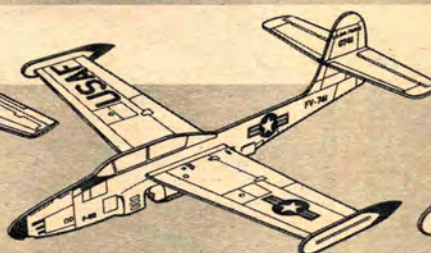
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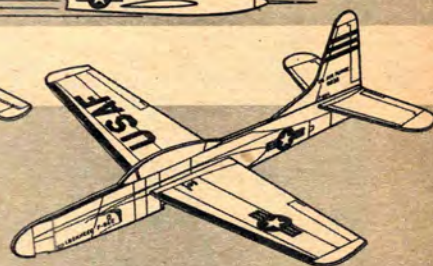
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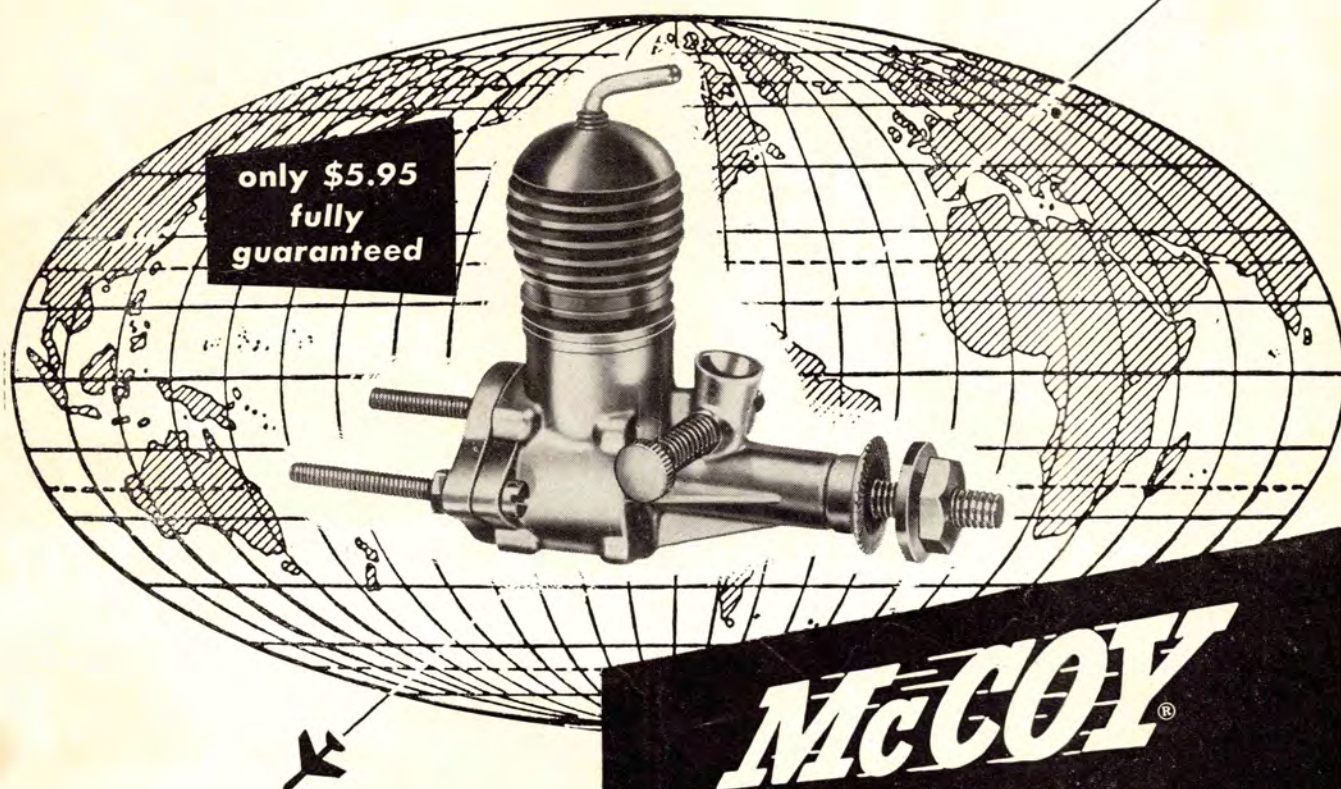
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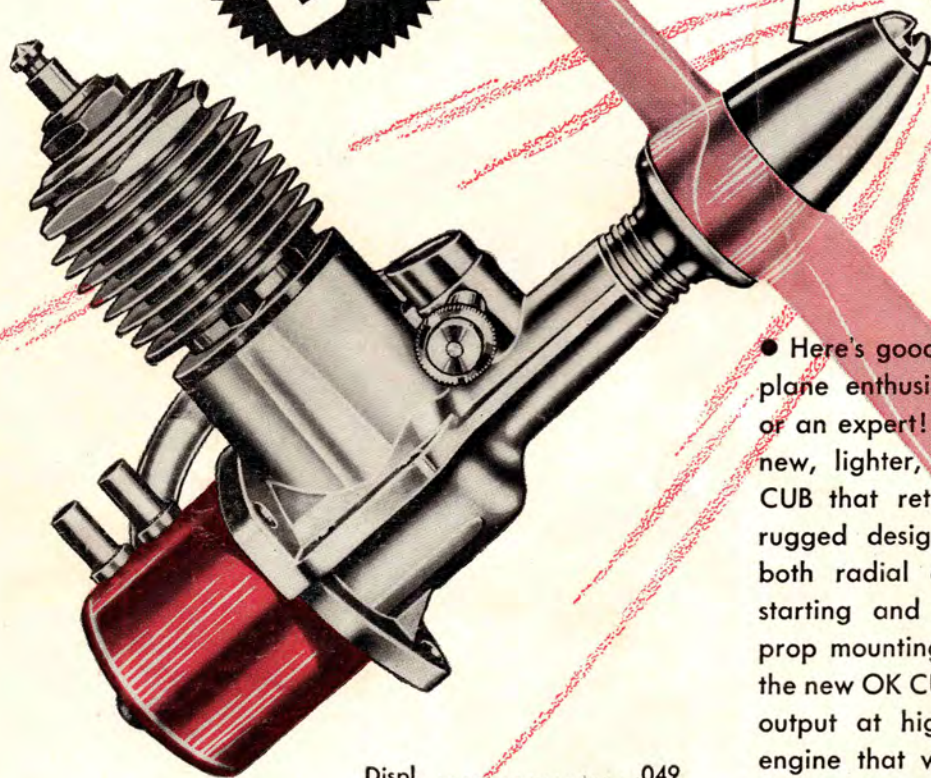
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